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PROFESSOR LIGNIÈRES,
Director of the National Bacteriological Institute, Buenos Ayres, South America.

THE VETERINARY JOURNAL

JANUARY, 1913.

PROFESSOR LIGNIÈRES, DIRECTOR OF THE NEW
BACTERIOLOGICAL INSTITUTE OF THE SOUTH
AMERICAN MINISTRY OF AGRICULTURE.

THIS well-known veterinary surgeon was born on July 26, 1868, at St. Mihiel, in the Department of the Meuse in France, and was educated at the Lycée Charlemagne in Paris. Joining the National Veterinary School of Alfort in 1886, he left in 1890, passing out with honours, and in the same year competed successfully for the appointment of lecturer on contagious maladies, public health, forensic medicine, and jurisprudence.

In 1894 he was appointed Principal Demonstrator in the same Faculty, and later on his chief—Professor Nocard—entrusted him with the direction of the courses in jurisprudence, legal medicine, and bacteriological technology.

In 1897, on the recommendation of Professor Nocard, M. Lignières was sent by the Pasteur Institute of Paris to investigate the infectious diseases of cattle in the Argentine Republic, and in 1897 he founded the Bacteriological Institute of the Ministry of Agriculture in Buenos Ayres, being appointed Director.

Professor Lignières subsequently became Professor of Contagious Diseases and of Bacteriology to the Faculty of Veterinary Science and Agriculture on its establishment in Buenos Ayres. He is also a member of the Société Centrale de Médecine Vétérinaire de Paris, and of the Zoological Society of France, besides being an Academician of the Veterinary Faculty of Buenos Ayres, and one of the South American representatives on the Permanent Committee of the International Veterinary Congress.

Among his writings should be mentioned:—

“Studies of Typhoidal Affections in Horses and of Infectious Pneumonia”; “The Streptococcus of Schütz”; “Study and Classification of Septic Hæmorrhagic Pasteurellosis”; “Study of Hog Cholera and Classification of Salmonellosis”; “Etiology and Serotherapy of Anasarca in Horses”; and “Studies of Bovine Piroplasmosis,” whilst in 1901 he demonstrated for the first time that there are many kinds of piroplasms.

Other writings deal with “Polyvalent Vaccination against Bovine Piroplasmosis,” “The Improvement of Cattle in Piroplasmic Zones,” “Argentine Anaplasmosis,” “A Study of Mal de Caderas,” “Actinomycosis,” “Actinobacillosis,” the latter work in collaboration with Dr. Spitz. Professor Lignières also wrote, in collaboration with Dr. Ramon Bidart, “A Study of Symptomatic Anthrax in Argentina,” “A Study of Epizootic Abortion,” “A Study of Local Reactions under Tuberculin Treatment,” “The Failures of Tuberculin,” in which he considers the association of reactions for the avoidance of frauds and for the assurance of more complete diagnosis. Among other works are “Studies on Anti-tubercular Vaccinations in the Struggle against Tuberculosis,” “Studies of the Bubonic Plague,” &c.

His books have brought him much honour and many substantial rewards:—

In 1899 he gained the Monbine prize, and in 1901 the Barbier prize of the *Académie de Médecine de Paris*. In 1900 he gained the Monthyon prize of the *Académie de Sciences de Paris*. The National Society of Agriculture of Paris, The “Société Nationale d'Acclimatation,” and the Society of French Agriculturists, have all awarded him gold medals. At the International Exhibition of Buenos Ayres, which commemorated the Centenary of the Argentine Republic, he obtained the first prize for his serums and vaccines. He achieved a similar success at the International Exhibition of Agriculture. In addition to all his other distinctions Professor Lignières is a Chevalier of the Legion of Honour and a Chevalier of the “Order of Merit” in Agriculture.

Editorial.

THE HUMANE SLAUGHTERING OF ANIMALS REQUIRED FOR FOOD.

THE members of the veterinary profession are more fitted by their special training and knowledge of anatomy than those of any other body to sit in judgment upon such an important subject as the humane killing of animals, and it is only their foolish and innate sense of modesty which has caused them to allow others to take the leadership which by right should belong to them. The average Englishman is by nature kind-hearted, and to inflict pain is foreign to his nature. As proof of this we have the high position which is occupied by the various societies who make it their business to protect animals from cruelty, and although for a long time ordinary cruelties have been sought for and redressed, it is only lately that a determined effort has been made on behalf of the animals used for food. That their destruction is necessary is an unfortunate fact, and that it is the solemn duty of man to accomplish this in as humane a manner as possible is also as undeniable a fact, but whether it is always done in the quickest and most painless manner is a matter for question. Certainly in the case of some of the smaller animals, especially the pig and sheep, there is room for much improvement, and even in the ox the method of causing death is not always as speedy and painless as it might be. Of the Jewish method of slaughtering oxen the less said the better, although why it cannot be forbidden by law in this country, as it has already been done in some other civilized countries, is a point upon which many people have made arguments. Certainly the whole scene of the fixing down and killing of a bullock as ordered by the Jewish rites is revolting and brutal to a degree. Where death is a necessity let it be speedy and not preceded by a scene of terror or the administration of forcible pain. We, as veterinarians, have a very earnest duty to perform, and more than any other body of men ought to urge upon Parliament and the general public the claims of animals to be dealt with in as humane a manner as possible; also, above all, we should endeavour to the best of our ability to show by what we do ourselves that our actions are humane, as humane as possible in consistency with safety. In the use of anæsthetics for operations and in our methods of painless destruction for our patients, when life is hopeless and no longer endurable, we should be right in the forefront. It is not only our right and our privilege, but a duty we owe to humanity, to the general public, to the animals of which we make a special life-study, and to ourselves. Let us then look to it that we are not wanting when our advice is sought upon the subject of the humane work in which we are supposed to have been trained, for it is our duty to know the whole alphabet of the subject, from Alpha to Omega.

General Articles.

FURTHER EXPERIMENTS WITH THE *MYCOBACTERIUM ENTERITIDIS CHRONICÆ PSEUDOTUBERCULOSÆ BOVIS*, JOHNE, AND WITH VACCINES PREPARED FROM THIS MICRO-ORGANISM.

By F. W. TWORT, M.R.C.S.Eng., L.R.C.P.Lond.,
Superintendent of the Brown Institution, University of London.

AND

G. L. Y. INGRAM, M.R.C.V.S.,
Late Veterinary Surgeon to the Institution.

IN 1910 we published a preliminary note on the cultivation of the *Mycobacterium*, often known as Johne's bacillus, and in November, 1911, communicated details of these experiments to the Royal Society, London; these were published in the early part of this year. In this paper we gave a description of the disease, and an account of the various attempts made by previous workers to cultivate the specific micro-organism. We also gave details of our own experiments, the formulæ of the various media on which we had succeeded in growing the micro-organism, the successful inoculation into bovines, and the preparation of vaccines, &c. It may be repeated that the essential constituent of our media consisted of the dead bodies of allied acid-fast bacilli; or various alcoholic, glycerine and other extracts obtained from such bacilli. A good medium consists of egg 75 c.c., 0.85 per cent. NaCl 21 c.c., glycerine 4 c.c., and dried killed *Bacillus Phlei* (the Timothy grass bacillus) 1 grm.

Dr. Holth, working in Professor C. O. Jensen's laboratory in Copenhagen, has published a series of experiments which confirm these results.

In our present paper we propose to deal with a few of the points mentioned in our last; these are:—

- (1) The nature of the essential substance in the allied acid-fast bacilli necessary for the growth of Johne's bacillus.
- (2) The possibility of growing Johne's bacillus on the bovine type of tubercle bacillus as well as on the human type.
- (3) The possibility of acclimatizing Johne's bacillus to grow without the presence of the dead bodies or extracts of allied acid-fast bacilli.

(4) John's bacillus with special reference to the growth on the surface of fluid media.

(5) The possibility of communicating the disease to animals other than bovines.

(6) Vaccines with special reference to a reliable and specific diagnostic reagent.

(1) THE NATURE OF THE ESSENTIAL SUBSTANCE IN ALLIED
ACID-FAST BACILLI.

In our last R. S. paper we noted, that if any of the bacilli used for preparing the media were extracted with alcohol in a Soxhlet's apparatus for three or four hours, the residue was no longer suitable for making an efficient medium for growing John's bacillus; but that the necessary substance was contained in the alcoholic extract. We noted further, that the extract could be divided into three portions, none of which were purified.

(a) A part soluble in hot alcohol but practically insoluble in cold.

(b) A part soluble in hot and cold alcohol and chloroform.

(c) A part soluble in hot and cold alcohol and water but practically insoluble in chloroform.

On media containing any of these parts we obtained growths of John's bacillus. We have recently attempted to purify substances contained in these three portions. The portion insoluble in cold alcohol has been freed from the remaining portions by repeated dissolving in hot alcohol and precipitating by cooling. The comparatively pure white wax separated was made up into media in various percentages, the basis of the media consisting of egg, glycerine and 0.85 per cent. NaCl as given above. These media gave uniformly negative results, proving the positive results previously obtained to be due, as we presumed, to an admixture of one or other of the remaining parts.

The portions (b) and (c) have also been investigated, but so far we have been unable to separate the essential substance in a pure state. However, we are inclined to think that it forms only quite a small part of the extracts (b) and (c), for the following reasons. It is possible to grow *B. Phlei* and allied bacilli in such a way that they are quite unsuitable for adding to media for growing John's bacillus. If a quantity of dried *B. Phlei* be extracted with alcohol as above, and the portions of the

extract (b) and (c) added to the egg medium in the usual percentages, *i.e.*, $\frac{1}{4}$ to $\frac{1}{2}$ per cent., they may prove to be unsuitable. That this is not due to any deleterious substance can be proved by placing a higher percentage of either of the extracts in the medium, when John's bacillus will grow. It may also be noted that the portions of the extract (b) and (c) are either both suitable and good, or both unsuitable, and that a good bacillary powder always gives a good extract, proving that the unsuitability of any particular extract is not due to any error in extracting. We are indebted to Dr. E. Mellanby for preparing the fatty acids from the alcoholic extract of the *B. Phlei*. The fatty acids freed from other substances gave negative results when incorporated in the medium.

In carrying out these experiments we have tested large quantities of material, and have often extracted 50 grm. of dried *B. Phlei* for a single experiment. It is also worthy of note that, if dried powders of human and bovine strains of tubercle bacilli are extracted with alcohol, the bovine type gives a good yield of extract which is also divisible into three portions like the human type, yet only the human type of bacillus or its extracts produce suitable media for John's bacillus. The experiments detailed above strongly suggest that the essential substance—whatever it may be—is quite specialized, and only present in small quantity even in the two portions of the alcoholic extract which are soluble in cold alcohol.

As to the formation of this substance by such bacilli as the *B. Phlei*, it is quite clear, in view of the variations in quantity noted, that the conditions of growth must play an important part in determining its production. It will be necessary to exercise caution in setting down definite conditions suitable for a maximum production, as so many factors may come into play; but certainly the medium on which the *B. Phlei* is grown, the time it is grown, and the temperature of the incubator are important points; the constitution of the medium being probably the most important. Ordinary glycerine peptone beef broth proves to be a suitable medium. We have used glycerine liver broth considerably, and although, as is well known, most acid-fast bacilli grow better on broths prepared from liver than on those prepared from muscle, yet *B. Phlei* grown on liver broth does not appear to make such good media for John's bacillus.

(2) THE POSSIBILITY OF GROWING JOHNE'S BACILLUS ON THE BOVINE TYPE OF TUBERCLE BACILLUS.

In our last paper we observed that, although the human type of tubercle bacillus was suitable for preparing the special medium, the few strains of bovine type we had tested proved to be unsuitable, all the media prepared with the bovine type giving negative results with Johne's bacillus. We have since tested several more strains of the bovine type, and from these experiments we are inclined to think that this type may contain a very small quantity of the essential substance, if grown under certain conditions. Our results were obtained with a tubercle bacillus isolated from a child's ear, but showing the characters of the bovine type. The bacillus was grown on egg medium at 40° to 42° C., and the bacillary powder or its alcoholic extract was added to the egg medium in double the usual quantity. Such media gave a slight growth when inoculated with Johne's bacillus. This observation, although interesting, does not alter our previous contention that the bovine type is quite unsuitable for making an efficient medium. It must also be remembered that our strains of Johne's bacillus have now been cultivated outside the animal body for some time, and are becoming acclimatized to artificial media, as further observations have proved.

(3) THE POSSIBILITY OF ACCLIMATIZING JOHNE'S BACILLUS TO GROW ON MEDIA WITHOUT THE PRESENCE OF THE DEAD BODIES OR EXTRACTS OF ALLIED ACID-FAST BACILLI.

This possibility was discussed in our last paper. So far all our strains, with one exception, have resisted every attempt in this direction. However, one strain that has now been growing outside the animal body for 18 months, and which was the first to give a surface growth on fluid media containing extracts of *B. Phlei*, has recently shown growth on a flask of ordinary alkaline glycerine peptone liver broth containing no extract of allied acid-fast bacilli. The flask was inoculated in January, 1912, with the surface growth of Johne's bacillus from a flask of glycerine liver broth containing dead *B. Phlei*. No evidence of multiplication was observed for four months; the bacilli then started to grow, at first slowly, and later more rapidly. Subcultures made on to fresh flasks of the same medium have also started to grow. The original culture has since been used as

a diagnostic vaccine, and the results are given at the end of the section on vaccines. In this experiment it is possible that a small mutation has taken place, and we anticipate that in time sub-cultures will grow even more vigorously, and that our remaining strains of Johne's bacillus will mutate, or vary, in the same direction.

(4) JOHNE'S BACILLUS WITH SPECIAL REFERENCE TO THE GROWTH ON THE SURFACE OF FLUID MEDIA.

At the time of publishing our last R. S. paper we had been able to get only one of our five strains of Johne's bacillus to grow on the surface of fluid media; but, as we predicted several more have since commenced to form film growth, and we expect that all strains will show the same character if cultivated for a sufficient time on artificial media. The growth is thick and irregular on the surface, but very slow to spread. Recently, Holth has been rather more successful than ourselves in obtaining surface growth, and in his paper draws attention to the characteristic thick knobby but slow growth on such media. He used broth made from liver that contained a glycerine extract of the tubercle bacillus, and often added a certain quantity of fresh serum, which he maintains further improves the medium. We found that it did not improve our original egg medium, so we performed no further experiments on these lines until a few weeks ago, when we tested dog's ascitic fluid with liver agar containing an extract of *B. Phlei*. The ascitic fluid was added fresh, without heating, just before setting the agar; for one batch the fluid was first passed through a Doulton porcelain filter. This series of experiments showed the agar to be improved by the addition of the fluid, especially when it was filtered before adding to the agar.

(5) THE POSSIBILITY OF COMMUNICATING THE DISEASE TO ANIMALS OTHER THAN BOVINES.

We have performed a considerable number of experiments to test the pathogenicity of Johne's bacillus on various animals, and have published results which show that Johne's disease can be given to bovines by inoculating pure cultures of the bacillus intravenously and by feeding the animals. On the other hand we failed to communicate the disease to rabbits, guinea-pigs, rats, mice, pigeons, and hens. Since the publication of these

results we have succeeded in giving Johne's disease to bovines by inoculating cultures of the bacillus into the peritoneal cavity and by means of a subcutaneous inoculation, we have also succeeded in giving the disease to a goat by inoculating a pure culture into the peritoneal cavity and to another goat by means of an intravenous inoculation. The diagnosis and *post-mortem* proof of these results are given in the discussion on vaccines. It may be noted here, however, that S. Stockman has observed a condition occurring naturally in a sheep, which is indistinguishable pathologically from Johne's disease; at that time the bacillus had not been grown, so that the exact nature of the micro-organism observed in the sheep was not determined. Since our results prove that a strain of Johne's bacillus actually isolated from a cow can give the disease to the goat, we consider it probable that it can be transmitted to other horned animals, and the condition observed by Stockman in sheep is probably caused by the same identical micro-organism. We have attempted to inoculate two sheep, but cannot yet say with what result.

(6) THE PRODUCTION OF AN EFFICIENT AND SPECIFIC DIAGNOSTIC VACCINE FOR JOHNE'S DISEASE.

In our last paper we discussed various curative and diagnostic vaccines for Johne's disease, and pointed out that one of our vaccines, prepared by growing Johne's bacillus on broth containing 1 per cent. of human tubercle bacilli, gave a marked reaction with an animal suffering from Johne's disease + tuberculosis and with those animals suffering from tubercular disease only. This and other experiments proved to us that the medium used was unsuitable for the preparation of a specific diagnostic vaccine. From further experiments we were led to recommend *B. Phlei* as the most suitable for the preparation of media, and we prepared some vaccines on these lines, but the only animal we had the opportunity of testing at the time was a Jersey bull, which gave a negative reaction, probably due either to the disease being very far advanced or the dose of vaccine being too small.

In Holth's paper will be found some experiments with a vaccine prepared by growing Johne's bacillus on a medium containing a glycerine extract of the tubercle bacillus. A series of calves were inoculated with cultures of Johne's bacillus, and tested some months later with tuberculin with negative results.

They were then tested with the special vaccine, and all showed some rise of temperature, while one gave a "typical reaction," the author, however, does not give the rise of temperature obtained. This result in an animal apparently free from tuberculosis is interesting, but as we have already indicated we consider that a diagnostic vaccine for Johne's disease is certain to be more specific if *B. Phlei* be used in place of the tubercle bacillus. It is probable, however, that if Johne's bacillus can be acclimatized to grow sufficiently well on ordinary glycerine broth made from beef or liver, then such a vaccine should be even more specific, and it will be seen from one result already obtained, which is given at the end of this section, that the vaccine so prepared, although weak, nevertheless produced a definite rise of temperature in the animal.

From our knowledge of group reactions in general, and from the recent work of C. C. Twort on the relation of Johne's bacillus to other acid-fast bacilli carried out by means of complement deviation and agglutination tests, it is improbable that an absolutely specific vaccine will be obtained, although, if properly prepared, a vaccine of Johne's bacillus should be sufficiently specific for practical purposes, and in fact as specific as tuberculin is for tuberculosis.

We have recently tested a fresh batch of vaccine, prepared by growing Johne's bacillus on ordinary glycerine peptone beef broth containing a glycerine-saline extract of *B. Phlei* (the Timothy grass bacillus). This culture was grown for nine months at 39° C., the whole was well shaken to form an emulsion of the bacilli, placed unfiltered into small flasks, and heated for one hour at 62° C. The vaccine was first tested on three fully grown bovines and on five calves about seven months old, and was inoculated intravenously in doses varying, according to the size of the animal, from 5 to 10 c.c.

No. 1, a Jersey bull, No. 2 a Shorthorn cow, and No. 3 a Jersey cow, all showed clinically the typical manifestations of advanced Johne's disease which they had contracted naturally. All had been tested on several occasions with diagnostic tuberculin with negative results; each animal received 10 c.c. of the special vaccine. No. 1 gave a maximum temperature of 105° F which was reached an hour after inoculation. No. 2 gave a maximum temperature of 106.1° F. five hours after inoculation,

and on the following day developed a violent diarrhoea which persisted after the temperature had fallen. No. 3 gave a temperature of 104.8° F. This was reached in four hours, and the temperature was not taken again; the temperature was accompanied by diarrhoea. We consider all these reactions positive.

Bovine No. 3 died three weeks after the inoculation, and on *post-mortem* examination showed the typical lesions of Johne's disease. The gut was very congested, and some hæmorrhages were present. There was no evidence of tuberculosis.

The five calves were inoculated with living cultures of Johne's bacillus about six months ago, when each received an emulsion of growth from one tube of egg medium. The strain used was that which we had isolated from the intestine of a calf in which we had produced the disease by the inoculation of a pure growth of bacilli; this calf and culture were described in our last paper. Of the five calves inoculated with this culture, Nos. 1 and 2 were injected intravenously, Nos. 3 and 4 intraperitoneally, and No. 5 subcutaneously. The animals did not thrive well, but showed no clinical manifestations of Johne's disease. All were tested with the vaccine described above about six months after the inoculation with the living cultures; calves 2 and 3 each received 3 c.c., and calves 1, 4, and 5 each 5 c.c. The following results were obtained: calves 2 and 3 showed no rise of temperature in six hours, and through an error were not tested again until twenty-four hours after the inoculation when the temperatures were normal. The temperature of calf No. 1 rose to 104.6° F in three hours, that of calf No. 4 to 105° F in six hours, while calf No. 5 showed no rise in ten hours, but when taken the following morning—twenty-four hours after the inoculation—the temperature registered 105.4° F, and was dropping.

A few days after the vaccine tests the five calves were killed, and *post-mortem* examinations performed with the following results:—

Calf No. 1, that had reacted to 5 c.c. of vaccine in three hours, showed the typical lesions of Johne's disease in the intestines and mesenteric glands; the bacilli were most numerous in the tissues of the ileo-cæcal valve, but were also present beneath the mucous membrane of other parts of the gut, and in the glands. The animal showed no evidence of tuberculosis.

Calf No. 2, that had failed to react to 3 c.c. of vaccine within

six hours, showed slight lesions of Johne's disease in the intestine, and the mesenteric glands appeared somewhat larger than normal. Several acid-fast bacilli were found in the mesenteric glands and a few beneath the mucous membrane of the ileo-cæcal valve. No tubercular lesions were found.

Calf No. 3, that failed to react to 3 c.c. of vaccine, showed typical tubercular bronchial glands, but no evidence of Johne's disease.

Calf No. 4, that reacted to 5 c.c. of vaccine, giving a maximum temperature in six hours, showed tubercular bronchial glands which were caseous, and in places, calcareous. Johne's disease was present in a moderately advanced stage, the bacilli in the intestinal wall, as is usual, were most numerous in the region of the ileo-cæcal valve. The disease in the glands was particularly well marked, due probably to the method of inoculation. Films from the glands showed a fair number of Johne's bacilli.

Calf No. 5, that had reacted to 5 c.c. of vaccine some time between the eighteenth and twentieth hours, was small and emaciated. It showed typical tubercular bronchial glands and early tuberculosis in the apex of the right lung. There was no definite thickening of the mucous membrane of the intestine, and the mesenteric glands were not much enlarged. Very few acid-fast bacilli were found beneath the mucous membrane of the ileo-cæcal valve, and several in one of the mesenteric glands.

All five calves showed some congestion of the mucous membrane of the intestine with occasional hæmorrhages, and a few of the glands showed hæmorrhages. This condition which was present only in a slight degree in calf 3, was probably caused by the vaccine inoculated.

Cultures were made from beneath the mucous membrane of the intestine and from the glands of all the cases, and the bacilli grew on the special media in all except calf 3.

From the results detailed above it is clear that the vaccine, prepared by growing Johne's bacillus on a medium containing extracts of *B. Phlei*, will cause a definite reaction in animals suffering from Johne's disease if the vaccine be given intravenously. In only one animal with the disease, calf No. 2, did we fail to observe a definite reaction; this may have been due to the early stage of the disease, but as we have pointed out, the

temperature unfortunately was not taken between the sixth and twenty-fourth hours, and the calf may have reacted during that interval.

We now tested the vaccine by means of subcutaneous inoculations, and as we had no more bovines at our disposal we used goats. In July, 1911, we inoculated two goats, one-month old, with a living culture of Johne's bacillus. The growth from one egg medium tube was made into an emulsion with 10 c.c. of 0.85 per cent. sodium chloride. Goat No. 1 was inoculated intravenously with 3 c.c. of the emulsion, and goat No. 2 was given 1 c.c. in the peritoneal cavity. At the time of testing the vaccine, which was eleven months after the inoculation of the living culture, goat 1 was thin, but otherwise there were no clinical manifestations of the disease, and the temperature of both was normal. Each animal received 3 c.c. of the vaccine subcutaneously. The temperature of goat No. 1 rose to 106.4° F. in nine hours, reached 106.6° F., and remained above 106° F. for over eight hours, and was accompanied by some diarrhoea. The temperature of goat No. 2 rose to 105° F. in nine hours, and 105.4° F. in ten hours, but was not accompanied by diarrhoea.

Both animals were killed and *post-mortem* examinations made. Goat No. 1 showed typical Johne's disease throughout the intestine and in the mesenteric glands. The bacilli were present in fair number. Goat No. 2 showed the disease in a very early stage, and several bacilli only were found. The experiments with these animals show, not only the efficacy of the vaccine when inoculated subcutaneously, but also the susceptibility of goats to Johne's disease.

As a final experiment we prepared a vaccine from the flask of ordinary glycerine liver broth on which we had obtained some growth of Johne's bacillus. The growth was well shaken and allowed to sediment. The fluid was then pipetted off and placed into small flasks; these were sealed and heated in a water-bath at 62° C. for one hour. The vaccine was tested subcutaneously in 10 c.c. doses on two of the bovines mentioned above that had given a definite reaction with the first special vaccine. With bovine No. 1, where the interval between the two tests was twenty-five days, the temperature rose from 102.2° F. to 104° F. in three hours. With bovine No. 3, where the interval between the two tests was only sixteen days, the temperature rose 1° F.

We consider the reaction obtained with bovine No. 1 to be satisfactory, as the vaccine was weak, and we anticipate that as soon as the bacillus will grow more vigorously on media which do not contain any extract of other acid-fast bacilli, then vaccines prepared from such growths will be as efficient as the first vaccine tested.

In conclusion, it should be noted that in all the positive results, with one exception, obtained with the special vaccines, the rise of temperature took place within nine hours.

Most of the expenses of these researches have been paid out of the interest of the Dixon fund, for which we are indebted to the University of London, and we have to thank the Royal Society for the Government grants which enabled us to purchase many of the animals. We are also indebted to Mr. De Vine, Mr. Gold, and Mr. Wilkinson, veterinary surgeons for sending us naturally infected animals.

CONCLUSIONS.

(1) *B. Phlei* used in preparing media for growing Johne's bacillus can be grown in such a manner as to contain very little of the substance on which the growth of Johne's bacillus depends. This "essential substance" forms only a small part of an alcoholic extract of *B. Phlei*. Johne's bacillus will not grow on media containing the wax separated out from the extract nor on media containing the fatty acids.

(2) Johne's bacillus may grow slightly on media containing certain strains of tubercle bacilli having bovine characters, and it is probable that the "essential substance" which is present in the human type of tubercle bacillus may also be present to a slight extent in the bovine type, although the bovine type never makes an efficient medium.

(3) After growing outside the animal body for over a year one strain of Johne's bacillus has been acclimatized to grow slowly on glycerine liver broth without the presence of the dead bodies or extracts of other acid-fast bacilli.

(4) At the time of publication of our second paper only one strain of Johne's bacillus showed surface growth on fluid media containing extracts of other acid-fast bacilli. More recently several of the remaining strains have commenced to form film growth on such media.

(5) Johne's bacillus can produce the disease in goats as well

as in bovines, and it is probable that other horned animals can take the infection.

(6) A diagnostic vaccine for Johne's disease prepared by growing the bacillus in a fluid medium containing the dead bodies or extracts of the human tubercle bacillus is not specific but, as we pointed out in a former paper, will also give a reaction with tubercular animals. If *B. Phlei* is used in place of the tubercle bacillus in preparing the medium, Johne's bacillus will grow better, and a diagnostic vaccine can be obtained which is both efficient and sufficiently specific for practical purposes. Moreover, Johne's bacillus has recently started to grow on ordinary glycerine liver broth without the presence of extracts of other acid-fast bacilli, and a comparatively weak vaccine prepared from the culture has produced a definite rise of temperature in a bovine suffering from Johne's disease. In future it should be possible to prepare a sufficiently strong diagnostic vaccine by growing the bacillus on glycerine liver broth or on glycerine beef broth as is done in the preparation of Koch's tuberculin.

In a positive reaction the rise of temperature usually occurs between the third and ninth hour, and may be accompanied by profuse diarrhoea.—*Centralblatt für Bacteriologie*.

FOOT-AND-MOUTH DISEASE.*

BY PROFESSOR B. BANG.

Copenhagen.

FOOT-AND-MOUTH disease is an acutely infectious disease which chiefly attacks ruminating animals and pigs. It is said also to infect horses, dogs, and cats, and even poultry, but such cases are extremely rare and have probably never occurred in this country. Man is attacked occasionally, but, fortunately, not often. Cattle, pigs, and sheep are the animals which are most affected by it.

SYMPTOMS OF THE DISEASE.

From three to six days, as a rule, elapse from the time of infection (but in some cases from two to ten days, and in the

* This article, abstracted from the *Journal of the Board of Agriculture*, is substantially a paper read before a meeting at the Royal Veterinary and Agricultural College, Copenhagen, on October 16, 1911, and translated from the *Ugeskrift for Landmaend*, Nos. 43 and 44, 1911. It contains, however, some recommendations and additions kindly made by Professor Bang at the Board's request.

case of the pig only one day), before the animal sickens. It is a sort of exanthematic fever—akin to small-pox, measles, scarlet fever, and the like—that is to say, the disease begins with an ache throughout the system, and the fever, which after one to two days is followed by an eruption. When this has come to a head the fever almost or entirely ceases.

The first symptom is, therefore, that the animal seems unwell, eats less, and, if it is a milch cow, gives less milk. The temperature rises at once, to 40 or 41° C. or more in a cow, but this fever lasts only a couple of days, and in slight attacks it may be quite low. Vesicles or bladders begin to form in the mouth, and occasionally on the lips, snout, and nostrils, on the skin round the hoofs—in cattle mostly in the cleft between the hoofs, and in pigs mostly immediately above the hoof on the outside, and in the skin of the foot joint. In many cases the skin round the teats is also attacked, and occasionally eruptions occur in the vagina of female animals.

The eruption consists in the formation of surface vesicles, the epidermis or the epithelium of the mucous membrane being lifted up in many places by an exuded watery liquid. The vesicles are small at the start, but usually increase quickly in size; this is especially the case in cattle, and this fact seems to have some connection with the fact that the epidermis of these animals is very thick, especially between the hoofs and on the tongue, so that it offers great resistance against the exudation pressure. The acute exudation, of course, causes pain, with the result that the animal goes lame, limps badly on the affected limbs, shakes its feet, lies down a great deal, and is unwilling to rise. Sheep and pigs sometimes creep about on their knees. Cows seem afraid to eat, keep the mouth shut, and make a loud smacking noise with their lips. Saliva forms in the mouth, and dribbles out in strings. If the cow's mouth is opened—a process which she is apt to resist—the vesicles above-mentioned will be seen. They occur mostly on the surface of the tongue, especially on the flat part in front, but also on the thick part farthest back. The number of bladders or vesicles is not large as a rule, often only five or six, but frequently they increase quickly in size. They are usually the size of a shilling or a half-crown, and sometimes attain a couple of inches in diameter. Large vesicles are likewise often to be found in the fore part of the toothless gums of the upper jaw,

and smaller ones on the inside of the lips, on the palate and cheeks, and less often on the underside of the tongue. As the epithelium on the back of the tongue is very thick it cannot be determined at first whether it really is a case of vesicles, but the eruption takes the form of large flat lumps covered by an apparently normal epithelium. If one tears a hole in one of these lumps, a clear liquid comes out. The epidermis can be loosened for some distance (sometimes one can tear away a piece of "skin" a couple of inches in diameter from the front part of the tongue), revealing a red—often very red—sore which is very apt to bleed. This exposure of the naked mucous membrane causes the animal sharp pain, which it shows by shaking its head violently, and at times it is driven quite wild. A little later the bladders burst by themselves without any such interference, and the loosened epithelium is detached, leaving large red sores. Often, however, the epithelium remains hanging on to either side of the sore, and in its macerated whitish state is then apt to present some resemblance to a loose croupous deposit.

Approximately the same process takes place in the cleft between the hoofs. Here the bladders or vesicles mostly begin at the back, but, as a rule, they combine into one immense bladder, which extends throughout the length of the cleft, and after it has burst and shed the whitish-yellow "boiled" looking epidermis a large red sore is exposed.

On the teats the vesicles may at first be very small but numerous. Often there is an annular vesicle round the mouth of the teat itself. The eruptions when occurring on the teats often combine into large, flat, somewhat flabby, irregular vesicles of a whitish-yellow colour. These are naturally easily torn in milking, and the epidermis soon cracks, as it is very thin at this point. The bladders are here also succeeded by reddish surface sores, which take some time to heal on account of the milking.

In other respects it may be said to be characteristic of the disease that it is very superficial. It amounts to a simple raising of the epidermis or epithelium of the mucous membrane caused by a serous exudation. There is no deeply-rooted inflammation of the mucous membrane or corium; the sore simply consists in the laying bare of the surface of these parts, and it has a natural tendency to heal quickly. In a case of a deep sore which destroys the corium or mucous membrane itself the healing may be effected

by the sore being filled with granulations, and the final healing may take place very slowly through the epidermis gradually stretching out from the sides; but in foot-and-mouth disease there are always small patches of cellular tissues at the base of the sore (down between the papillæ of the mucous membrane), and the sore may therefore in a very short time be covered with newly-formed epidermis over the whole surface simultaneously. Thus it is found that these large sores can heal in eight days or less. The locality of the sore may, however, be traced for some time by a smooth, slightly depressed, thin-skinned patch, as, of course, some time elapses before the epidermis reaches its normal thickness.

Owing to secondary infection of the sore more severe inflammation may of course arise later, but this occurs extremely seldom in the mouth, especially when the animal is given suitable soft and clean fodder, whilst it is more apt to happen when the disease attacks the feet, especially the hind legs, and when the animal stands in manure or dirt mixed with urine, as, for instance, in dirty stalls without litter. Under such conditions deep gangrenous inflammation of the skin between the hoofs, sometimes even involving the tendons and joints—the malignant panaritium—is frequently met with, and is due to infection with the necrosis bacillus, which occurs so largely in manure. Other bacteria can, of course, also enter the sore and give rise to inflammatory processes.

The teat sores may, as above stated, become irritated by the milking, and they are also liable to be infected when the animal's litter is dirty, and deeper sores may thus be formed, which will heal slowly. But what is more dangerous still, bacteria may penetrate from the sores which frequently form on the tips of the teats into the lactiferous ducts and cause inflammation of the udder, which often leads to the destruction of one or more quarters.

Apart from these complications, which, under favourable conditions, and when the animal is well looked after, are not very frequent, the disease is usually not a dangerous one. The cow attacked by it is usually very ill for some days, eats little or nothing, gives little milk (which on the other hand contains more fat than under normal conditions), and becomes very emaciated; but about three to four days after the mouth complaint has begun

she begins to eat well again, she grows fatter, and resumes giving a satisfactory amount of milk. The foot lesions often cause inconvenience a little while longer, but, given favourable conditions, these also heal surprisingly quickly, and most animals seem quite well again after one to two weeks.

Sheep and pigs usually have less violent attacks than cattle, and they are more liable to the foot disease than to the mouth disease, which often escapes notice. Pigs, however, often shed the entire horn of one or more hoofs, especially when affected animals are forced to walk.

NECESSITY FOR DRASTIC ACTION.

In these circumstances, is it not a very mild disease which it is hardly worth while making such a fuss about? This was the general opinion in the old days. It was not until 1875 that the disease was classified in Denmark as a "malignant infectious disease," for which the law requires that infected cases shall be rigorously isolated. Before that time the public authorities usually did very little to prevent the spread of infection, and, as a result, the disease showed great fluctuations, and was particularly prevalent in 1841-42 and in 1869-71.

It is quite natural that many a farmer whose stock has had the disease in a mild form thinks that the isolation is worse than the disease itself, but it is nevertheless with good reason that general opinion as to the economic significance of the disease has undergone such a remarkable change during the last thirty to forty years. As a result it is now regarded as one of the most harmful diseases among domestic animals, and the greatest efforts are now being made to keep it in check, although, unfortunately, in many places with little success.

It is true that the mortality is mostly low, usually barely half per cent. among adult animals, but young calves are very apt to die, and sucking-pigs under 14 days nearly always die when the sow gets the disease; even when older, most sucking-pigs die, and the survivors are very apt to be unthrifty.

There are many instances of the disease developing a very malignant character, with a mortality of from 5 to 50 per cent. among adult animals, and from 50 to 80 per cent. among young animals. Malignant epidemics of this kind are most apt to attack dirty and over-crowded farms, but they may also occur under favourable hygienic conditions. The disease may also occur in

a very malignant form with numerous sudden deaths reminiscent of anthrax. Such epidemics have been observed in many different countries both in former and recent times. In 1839, 2,000 head of cattle died in the Cantons of Berne and Fribourg in Switzerland; and in 1872, in the French Department of Nièvre, more than 20 per cent. of the calves and over 22 per cent. of the pigs were destroyed by the disease in the course of two months. In the summer of 1892 there died in Bavaria over 3,000 head of cattle, and in 1896 in Würtemberg, 1,500. At Barcelona, in Spain, there died in 1901, 50 to 70 per cent. of the young cattle. In Transylvania 711 out of 7,498 head of cattle, or 9.4 per cent., were destroyed in 1899. In Holstein and Schleswig the disease occurred last summer (1910) in a distinctly malignant form. According to Dr. Bugge, of Kiel, deaths occurred in practically all the large herds, and in many cases the loss amounted to 5 to 10 per cent. or over. Thus he mentioned instances in which 5 out of 20, 10 out of 80, 10 to 12 out of 100, and 10 out of 200 had died. In the September number of the *Landwirtschaftliches Wochenblatt* a tenant writes that 8 out of his 80 cows had died, and that in two villages in the neighbourhood 25 and 15 cows, respectively, had been destroyed by the disease.

However, it is not these comparatively rare cases of great mortality that cause the chief trouble. It is the acutely infectious nature of the disease which makes it so serious. When it is left alone it spreads to an enormous number of farms, and with the present quick and easy means of communication it may quite easily extend to nearly all the farms of a country or province, with the result that the aggregate of numerous small losses represents in the end an enormous sum. Thus, the loss suffered by Germany in 1892, when over 1,500,000 head of cattle, over 2,000,000 sheep and goats, and over 400,000 pigs were reported to be infected, was estimated at over 100,000,000 marks (£5,000,000), and this year (1911) the loss is sure to be much greater.

This great loss is first and foremost due to the decreased secretion of milk. During the illness itself the yield of milk is nearly always greatly reduced, often to half the normal or less. However, as soon as the animal begins to eat again it usually rises, but it is only in exceptional cases, after very light attacks, that the secretion of milk again comes up to the normal.

Mr. Andersen, veterinary surgeon at Gimlinge, who in 1892-93 had charge of the disease in the part of south-western Sjaelland which suffered most from the disease, states in his report (*Maanedskrift for Dyr læger*, vol. X.) that many cattle-owners claimed that they were 4.8 lb. short of milk per cow daily after the epidemic. Others reckoned that they only lost 2 to 4 lb. daily, but even this small loss, if it continues throughout the milking period—which it usually does—will amount to a good deal of money. Andersen further writes: "When a cow sickens six to eight weeks before she is due to become dry, at a time when yielding 10 to 15 lb. daily, the dry period begins simultaneously with the disease." This is also an appreciable loss. Moreover, it is not unusual for a cow when attacked by the disease whilst dry to yield very little or no milk after calving, in spite of the fact that the udder is to all appearances healthy. The same may apply to cows calving whilst in the grip of the disease. Occasionally, according to Andersen, it is possible to work up the milk yield from such cows, but it seldom amounts to very much, say, one-quarter to one-half of the normal.

To this it may be added that in nearly all outbreaks some cows contract inflammation of the udder, with the result that many of these cows become more or less worthless for milking, whilst some cows get a malignant and persistent hoof complaint which weakens them greatly. Furthermore, a number of young calves and pigs die, as well as adult animals occasionally; abortion is also liable to occur; tuberculosis may sometimes suddenly attack a herd after it has been through foot-and-mouth disease—and all this without taking into account the emaciation caused by the disease (a matter of great importance when dealing with cattle fattened for killing).

It will be seen from the foregoing that it is hardly an exaggeration to estimate the economic loss from the disease at an average of 30 kroner (= 34s.) per cow. In Germany, however, the loss is put down at 50 marks (£2 10s.), and Dr. Remmelts tells me that the loss in Holland amounted to at least 25 gulden, or over £2 per cow.

To this must be added the fairly heavy expenses which are required for the proper care of the sick animals and the great loss which in many cases is the inevitable result of the isolation of stock, the issue of notices as to the boiling of milk, and the

difficulties in connection with trading, which latter may be of the utmost importance to a country like Denmark, where the export of live cattle constitutes such a valuable item of commerce.

There is thus every reason for dreading the disease and doing everything possible to prevent its gaining a firm footing.

FOOT-AND-MOUTH DISEASE IN VARIOUS COUNTRIES.

During the past season a tremendous wave of the disease, probably the greatest epidemic that has ever taken place, has passed over the whole of central Europe. At the end of May, 1910, it broke out in several districts of East Prussia, and simultaneously at Chemnitz in Saxony. It is said to have been introduced from Russia, and to have spread from cattle bought in a large cattle market in East Prussia. By degrees it extended from east to west over the greater part of the German Empire, and on September 15, 1911, 37,180 centres were affected.

Austria and Hungary were also severely attacked by the disease at the same time as Germany, presumably also through infection from Russia. In these countries it has taken an even greater hold than in Germany. Thus, on October 4 there were 111,382 infected centres in Austria, and on September 27, 45,563 in Croatia and Slavonia. In Hungary the disease has been very general, but is now (1911) confined to 7,961 centres.

In France 33,966 infected centres were notified in August, 1911, and in Belgium, on July 31, 5,225 centres and over 50,000 head of cattle. In Holland 12,000, and at one time as many as 18,000 centres have been notified, and Dr. Remmelts informed me lately that in the western parts of the country hardly a single herd had been spared, whilst the infection in the eastern part was less prevalent.

In Italy over 18,000 animals were attacked during the week preceding August 6, 1911, in addition to 107,000 animals over from the previous weeks. These figures show clearly enough what a scourge to cattle this disease now is in Europe.

HISTORY OF FOOT-AND-MOUTH DISEASE IN DENMARK.

This is instructive in many respects. After the fairly severe epidemic in 1869 and 1870 had died away in the course of 1871, only occasional doubtful cases occurred during the next few years, and in 1875, 1877, and 1878, there were a few series of

cases, the nature of which, however, is also partly open to doubt. Thereafter we enjoyed complete immunity until the latter part of 1892, when the disease occurred almost simultaneously in the neighbourhood of Skelskär, at Taasinge, and at Holstebro. Thence it spread fairly rapidly in south-western Sjaelland, and remained in this country until August, 1893.

In no instance was it possible to determine in what way the disease was first introduced into the country—and this was also the case with later epidemics—but there can hardly be any doubt that it came to us from Germany, which was very badly ravaged during that year. I am inclined to connect the dying out of the disease with the introduction of a very careful system of disinfection of the railway wagons used for cattle transport, this disinfection having originally been very faulty.

Later, during the next few years, there occurred a few very remarkable recurrences on estates which the disease had attacked six months to a year previously. Thus it broke out on November 20, 1893, on the Bjernedegaard estate at Sorö, where it had made itself felt for the first time on November 16, 1892; next on November 30, 1893, at Dallund (Fyen), where it had occurred for the first time in May of the same year; and on December 5, 1893, at Rynkevang, near Kallundborg, where the first cases occurred on December 12, 1892. Finally, on February 15, 1894, it broke out on the Brorupgaard estate at Slagelse, where it had occurred in March, 1893. At all four places all the cattle which had been born on the estate after the last attack were killed, and also all cattle subsequently added (respectively, twenty-one, four, thirty-five, and, I think, about forty head), whilst I let the greater part of the stock live—that is to say, all the animals which had been through the disease on the previous occasion, and all these animals showed themselves to be immune.

As during this period there was not a trace of the disease elsewhere in this country, and there could not have been any possibility of infection from abroad in any of the places mentioned (except through fodder, which is imported by all farms here), it must be assumed without a doubt that the infection had remained hidden on the farm from the previous attack.

These four recurrences at the end of six months to a year show in each instance that the virus may possess much greater tenacity than is usually supposed. It is generally taught that the

virus can be destroyed fairly quickly, say, for instance, after desiccation for twenty-four hours, and that it is fairly easily killed by means of ordinary disinfectants. But, nevertheless, it has also been found that it may remain active in an attenuated condition for three to four months in hermetically sealed glass tubes, and this is further supported by the experience which we had this year in Jutland, where the disease in the neighbourhood of Aarhus returned about three months after an outbreak and a few days after carting out the manure left from the stock which was first attacked. It is therefore advisable in practice to assume that the virus may persist for a very long time.

Of course it may be questioned whether the recurrences referred to may not be attributed to entirely different causes connected with what we have learnt in recent times about various contagious matters, as, for instance, in the case of human typhoid, where certain individuals, so-called "bacillus carriers," although apparently cured, nevertheless continue for years to give off virus, and may prove a great danger to the community as carriers of infection. In the case of foot-and-mouth disease, however, this hypothesis is controverted by the fact that I allowed the animals which had previously been through the disease to live, and that the disease nevertheless died out in the first three instances after the second outbreak and in the fourth instance after the third outbreak.

In another respect also my observations are very interesting. I refer to the question whether cattle as a rule acquire immunity by passing through the disease. On all the four farms this proved to be the case, and at Brorupgaard the immunity lasted two years. The text-books on the subject state that immunity is frequently acquired (some authors put it down at three to five or seven years), but that such immunity may in very many cases be of short duration; in fact it is asserted that cattle are quite frequently attacked by the disease several times in the course of one year. It may, however, be safely assumed that these are rare exceptions; I firmly believe that immunity is the rule. Seeing that, for instance, in Germany the disease diminishes appreciably after very widespread outbreaks, I can only conclude that this is largely due to the fact that the cattle have in many cases acquired immunity for a more or less protracted period.

During the period from August, 1893, to April, 1896, we

experienced in Denmark only the above-mentioned five cases on farms which had previously suffered from the disease. But subsequently, during the years 1896-1901, we had each year a few outbreaks, all of which were stopped very quickly by killing all the ruminants and swine on the farm.

After that we had a period of immunity until February 1, 1904, when the disease suddenly broke out in the island of Sjaelland, on a farm at Frösley in the southern part of Stevns. This herd was killed, but when the disease nine days later made its entry on the neighbouring farm, the then Minister of Agriculture would not continue the killing. Although much was done to prevent the disease from spreading, and, for instance, one and later on two veterinary surgeons were despatched to Storehedinge in order, as far as possible, to save the local men from having anything to do with the disease, it spread during the following months to twenty other herds, of which only one lay outside Stevns. In seven cases personal contact could be proved to have preceded the outbreak of the disease, and in three other cases this was probably also the cause. In one case infection was put down to mating with an infected bull. In several cases the infection was probably transmitted by the carting out of manure from infected herds. To the last place the infection was probably carried by rooks, which had a colony close by.

Subsequently, Denmark remained free from the disease for six and a half years, until November 24, 1910, since when there have been a number of outbreaks up to the present year (1912).

WAYS IN WHICH THE DISEASE IS TRANSMITTED.

As previously stated, it has not been possible in any one of the fairly numerous outbreaks of foot-and-mouth disease which we have had to deal with since October, 1892, to prove in what way the infection was conveyed to the herd which first became infected. It is a striking fact, however, that the disease has, with very few exceptions, been restricted to estates in the southern part of the country—chiefly Lolland, Langeland, South Sjaelland, Fyen, Southern Jutland (Kolding, and the neighbourhood near the Vejle Fjord); and that once only, in 1892, it attacked Holstebro, and once, in 1910, the neighbourhood west of Aarhus. An estate close to the coast has had more frequent recurrences of the disease than any. This fact is difficult to

understand on the assumption that the infection is conveyed by fodder from foreign countries, which is distributed throughout Denmark; but, on the other hand, it points distinctly to the infection being carried hither from Germany, where the disease has existed continuously. It must be a natural mode of transport, but which? I have thought for many years that it might be birds, such as gulls, crows, rooks, &c., which might conceivably fly across from Germany and carry infection on their feet, or possibly in their intestines, after having collected it from infected manure. I also do not think it impossible that the infection may have been carried by the wind. It might be a question of particles floating in the air in a free condition, or attached to the legs of insects, or possibly spiders' webs, called in Danish the "flying summer," which just at this time of the year are seen flying about in profusion.

The virus itself is not known, but it has been proved to exist in the matter contained in the vesicles, and to be liberated when these burst. Thus it comes out in the saliva, the manure (after passing through the intestines), and the matter discharged from the vesicles on hoofs and udders. It is known that the virus is a very minute object—doubtless a microbe—and that it passes through the pores of a filter; that is to say, it is smaller than the smallest of the bacteria visible under a microscope. It is likewise known that very little is needed to infect an animal with the disease, inoculation with $\frac{1}{5000}$ c.c. of the contents of a vesicle being sufficient. Such small objects do not require large means of transport.

I have not had time to examine very closely the direction of the winds prevailing at the various points where the disease has appeared, but a cursory inspection of the printed records of a meteorological institution shows that southerly, and sometimes south-westerly and south-easterly, winds have been blowing before each outbreak.

The remarkable fact that the disease may break out in an otherwise healthy country without any apparent cause has been observed several times in England, which is no more inclined than Denmark to receive animals with foot-and-mouth disease from infected countries. The theory of the wind as an infection-carrier is an old one, and in Holland observations have recently been made which seem to support it.

In Sweden, observations were once made which seem to indicate that the infection can remain for a long time with an animal which has passed through the disease. A Dutch bull was once, after undergoing the prescribed period of quarantine, imported into a herd in the far north of Sweden, and several months later this herd was visited by the disease. It was then found that the Dutch bull had a deep slit at the back of the hoof—such as is often formed during the disease when the horn comes off—and that this slit, just at the time that the disease broke out in the herd, had grown so far down as to release, presumably, the virus hidden in it. But there can be no question of any such infection in Denmark, as in no case have cattle been imported from abroad.

Whatever may be the connection between the various cases here and foreign importation, it is plain that at the present time we are very liable to receive infection from Germany. It is difficult enough to avoid its introduction through persons who have visited German cattle markets or who have come into touch with infected herds in Germany, but we are quite at a loss to cope with infection carried by birds or by the wind. The frequent occurrence of the disease at the time of year when turnip leaves are used as fodder might indicate that the latter are especially liable to carry the disease. This could not be the case if the turnip-leaves were used in the form of silage fodder. Although, for the reasons above stated, I do not believe much in the carriage of infection through foreign fodder or packing, it cannot, of course, be denied that there is something in the suspicion.

SUCCESSFUL LOCAL TREATMENT OF GOITRE.

By DR. MILLER.

Tübingen.

DR. MILLER successfully treated a mongrel fox-terrier by daily rubbing with Ubele's ointment. —

R Iodi. pur.	...	...	...	...	}	0.5
Pot. iodidi	...	...	...	...
Aqua destil.	...	...	...	...		āā 5.0
Adip. suill.	...	...	...	...		10.0
Adip. lan.	...	...	...	...		40.0
M. f. unguent.						

The treatment lasted four weeks.—*Berliner tierärzt. Woch.*

Clinical Articles.

COCAINE AS A LOCAL ANÆSTHETIC DURING THE AMPUTATION OF A PORTION OF THE HORSE'S TAIL.

By S. J. MOTTON, M.R.C.V.S.

Penzance.

THE fact that the operation of docking may occasionally be called for as the result of an accident would be a sufficient excuse for discussing the use of a local anæsthetic in connection with it.

Without treading on the vexed question as to whether one should or should not dock for other reasons, seeing that large numbers of animals are annually docked, if it became the general practice to perform the operation painlessly the bulk of the objections raised would fall to the ground.

The first case upon which I was tempted to try the effect of cocaine was a cart sucker. The tail was amputated in the ordinary way, but before searing the stump, a pad of cotton-wool soaked in 4 per cent. cocaine solution was held against the raw surface for about three minutes. The animal was absolutely unconcerned while the hot iron was being used.

The result was so satisfactory that when an eight-year-old pony mare was brought to be docked some time later a further trial was resolved upon.

This time, however, an inch above the seat of operation, 15 minims of 4 per cent. cocaine solution were injected at each of four places around the tail, these places being about equidistant from each other. Five minutes were allowed to elapse before the operation was carried out. The animal evinced no indication of pain when the tail was cut off, and apparently did not feel the searing-iron.

Since the pony was operated upon three animals have been treated in the same way (they were, respectively, two, three, and four-year-old cart animals), and each time the result has been satisfactory.

The syringe used was an ordinary hypodermic syringe with push mount. A twitch was applied in every case, and when possible a foot was held up while the hypodermic needle was being inserted. All the animals objected a little to the insertion of the needle, which was inserted slowly and with a slight rotary movement, but none behaved at all dangerously. No doubt some

animals may be met with which would be too rough to permit one to use cocaine hypodermically, but in those instances it is possible that the method adopted in my first case might prove useful.

I have not removed the twitch in either case until the "docking" has been carried out, but two of the animals were seared without the twitch being in position.

However, it may be advisable to keep the twitch on until the whole operation has been completed, for a time may arrive when the anæsthetic for some reason may fail. If the few cases recorded above prove to be anything in the nature of a fair sample, the comfort one experiences in carrying out the operation in this way more than justifies the use of cocaine.

Four per cent. solution has been used, but probably a weaker solution would act quite well.

AN INTERESTING ANEURISM IN A FOAL.

By ARTHUR ROUTLEDGE, F.R.C.V.S.

Louth.

My attention was called to a Shire filly, six months old, apparently quite well in the afternoon, but in the evening observed to be lame and stiff, and apparently in pain. When I arrived about 9 p.m. I noticed unconscious swishing of the tail, crouching, and occasional attempts to lie down. At short intervals fæces were passed in small quantity, and the foal kept looking anxiously at the flanks. The pulse was almost imperceptible, temperature of 105.4° F., mucous membranes injected, and respirations hurried and very laboured.

As I had known the animal to pass several strongyles, I diagnosed colic as being probably due to this cause, and gave a guarded prognosis. A draught composed of ether, chlorodyne, and linseed oil was administered, and hot cloths with turpentine stoups were applied to the abdomen. The body surface became very cold, the temperature rose to 106.2° F., and death occurred about 5 a.m. *Post-mortem* examination revealed a fusiform aneurism about 6 in. by 2 in. of the mesenteric artery with thickened walls, and about seventy worms (*Strongylus armatus* variety) were counted from the thrombus in the anterior.

The bowels were inflamed, and all the serous membranes were covered with petechial spots.

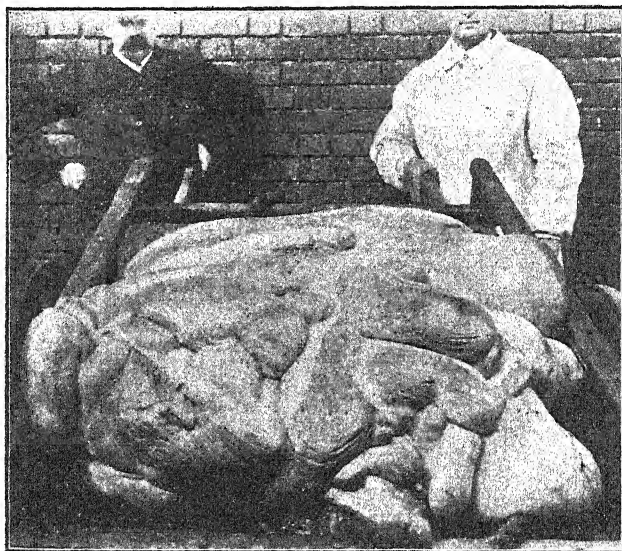
AN ENORMOUS OVARIAN TUMOUR.

By J. A. JORDAN, M.R.C.V.S.

Municipal Abattoir, Belfast.

THE ovarian tumour, of which a photograph is herewith depicted, was taken from an aged cow, in poor condition, after slaughter in the Belfast abattoir.

She had been purchased as a "back springer," and for some time of late had had great difficulty in rising, whilst for about a week before slaughter she was unable to rise at all.



Her body was so broad across that she could not pass through an ordinary doorway. The weight of the tumour was 370 lb.

AN UNUSUAL FOREIGN BODY IN THE ŒSOPHAGUS OF A HORSE.

By A. E. ROBERTS, M.R.C.V.S.

Chepstow.

On July 19 a young cart gelding was fetched in from grass by the wagoner with the intention of being sent to work. After partly harnessing the animal he noticed something wrong, as when lifting the head to put the collar on the colt began to cough, foam at the mouth, stamp and kick, and then hang the head down, looking very distressed.

I was hastily summoned, and on getting to the farm found the floor of the box quite wet with saliva.

Suspecting some foreign body I explored the mouth, and then noticed a swelling over the œsophagus some 7 or 8 in. down the neck. Palpation revealed this to be quite hard, and as I was endeavouring to work it upwards the horse coughed violently, and brought up a piece of limestone 2 oz. in weight, of triangular shape, and measuring $1\frac{3}{4}$ in. by $1\frac{1}{2}$ in. and $\frac{3}{4}$ in. thick, with a very uneven jagged surface. The symptoms abated at once, and no subsequent treatment was necessary.

RHEUMATIC POLYARTHRITIS IN A HORSE.

BY CHIEF VETERINARY-SURGEON WIEDEMANN.

A SEVEN-YEAR-OLD officer's horse fell ill at the beginning of October, 1911. The first symptoms were those of fever. Swellings of a painful nature then attacked several of the joints.

The horse was treated for sixteen days with salicylate of soda in electuary, having 150 grm. each day for four days, 100 grm. each day for four days, 50 grm. each day for four days, and a further 25 grm. each day for the last four days.

The limbs were rubbed with sol. unguent (Bengen) and wrapped in wool and bandaged.

The horse remained out of use for three months, and was then ridden again. At the end of January he was examined and found to have valvular disease developed after some endocarditis. There was compensatory hypertrophy of the heart. — *Zeitschrift für Veterinärkunde.*

GALL-STONE COLIC IN THE HORSE.

BY VETERINARY-SURGEON GRIMM.

ON January 26, 1912, at 11 o'clock at night, the stable guard noticed that the horse "Edi" was shivering and sweating profusely. Examination showed that the horse was standing listlessly in the stall with the head depressed to the ground. He would not stand over when asked; every movement was made unwillingly, and severe pain was evident. The body was covered with cold sweat; the horse trembled all over the body. The conjunctivæ were coloured pale rosy red. The pulse by auscultation of the heart was 46, regular and

weak; heart sounds clear; heart dulness not augmented; the temperature, taken at the rectum, 38·7° C.

Breathing laboured, pumping 28 per minute; respiration forced; nothing abnormal detected in the larynx, trachea, or bronchi. Auscultation of the lungs showed increased vesicular murmur; percussion, loud resonance. No tympanites; intestinal murmurs wholly suppressed on both sides. Dung and urine had not been noticed for two days. Rectal examination showed slight twisting of the rectum to the right on its long axis, and only after rectifying its position could the examination be conducted. The bladder and posterior part of the rectum were empty. The anterior part of the intestine had a normal position, and was chock full of firm, pulpy masses of food. Treatment consisted of massage of the intestine from the flanks, in Priesnitz's compresses, and warm-water clysters. Internally the horse received chloroform, tincture of assafoetida, and tincture of opium in equal parts as a draught. After an hour and a half a draught of extract of aloes, spirits æther nit. and water, and subcutaneous injections of hydrobromate of arecolin (0·1 to 10·0 of water in fractional doses) were given.

At 2 o'clock the same night the heart-beats were weaker and irregular. Fifty grammes of camphorated oil were therefore injected subcutaneously. A quarter of an hour afterwards the heart-beats were quieter and stronger, and in a further quarter of an hour the pulse was 60, but weak. Breathing remained laboured and pumping, and went up to 60 per minute. Conjunctivæ pale red and almost white.

At 6 o'clock the horse stood with propped limbs and sunken head. Dung and urine were not passed; no intestinal sounds. Suddenly the horse fell on its side and died.

Post-mortem showed: Anæmia of the external visible mucous membranes, bloody serous exudate in the abdominal cavity, stoppage of big masses of food in the large colon, and thin, pulpy fluid in the small intestine, enteritis, cirrhosis of the liver, gall-stones, parenchymatous inflammation of the heart muscle, hæmorrhages under the pericardium, especially at its apex.

The changes in the liver were remarkable: the right lobes were yellowish brown and the left dark brown in colour, swollen, and had rounded-off edges. They were three times their normal size, consistency hard. On its surface the liver was nodular, and at the

top of the knots clear coloured. On incising the right lobe a yellowish-red, penetrating, stinking fluid escaped. Gall ducts greatly distended, filled with this fluid, and walls greatly thickened. In the left lobe the gall ducts were much dilated, and their walls $\frac{3}{4}$ cm. thick. Little gall-stones were found throughout these ducts to the number of several hundred. In the chief exit there was a yellow structure as big as a pigeon's egg; its long diameter measured 4 cm. The colic in this horse seemed to be intimately connected with the presence of gall-stones.

It was remarkable that during the whole course of the ailment there was complete absence of jaundice.—*Zeitschrift für Veterinärkunde*.

FATAL PERITONITIS AS THE RESULT OF PERFORATION OF THE INTESTINE BY THE STEM OF A PLANT IN THE HORSE.

By LÉTARDI.

THE subject of this note, a horse, at first showed decline of appetite and slight colic. Temperature 37.8° C. Intermittent gripping pains, later on, fever. Increase in seriousness of symptoms, and death after four days. *Post-mortem*: In the abdominal cavity about 15 litres of purulent fluid; cæcum, end portions of the ileum and large colon covered with thick membranes. In the middle of the false membranes a purulent mass in the depths of which a foreign body was present, which had penetrated the cæcum. This body consisted of the stalk of a herbaceous plant, probably lucerne.—*Der Tierarzt*.

STONE IN THE URETHRA OF A MARE.

By EGGINK.

SYMPTOMS: Incontinence of urine. Each time on lying down a certain amount of turbid urine was passed from the under commissure of the vulva along the buttocks, skin acutely inflamed, hair fallen out, slight emaciation, loss of appetite, increased thirst. On vaginal exploration E. found a hard swelling about the size of a hen's egg. The finger introduced into the bladder revealed a mass of firm consistency, consisting of several fragments, corresponding to each other, which filled out the bladder cavity. With the finger E. removed a

number of hazel nut to walnut sized stones which were superficially faceted, besides the bladder contained gravelly urine and its wall was much hypertrophied. Treatment consisted in irrigations of warm boracic acid twice daily, 2 grm. of salicylic, then irrigations with silver nitrate 1-2 per cent., zinc sulphate 1-2 per cent., potassium permanganate; salol 2-10 grm. per day. The mare had a difficult parturition the year previously, embryotomy having to be performed. Some time after she urinated frequently, and then incontinence of urine came on. E. believes that in carrying out embryotomy a traumatic vaginitis arose, which by continuity extended to the bladder and produced infectious catarrh of the bladder and cystic calculi.—*Der Tierarztl.*

CASTRATION STANDING.

By DEST V. S. REIMER.

Freiburg.

For opening the scrotum Reimer uses a specially handy instrument, a so-called hook-bistouri, made by the firm of Hauptner. He claims that by its use a deep incision through the scrotum, dartos, and tunica vaginalis can be made. The parenchyma of the testicle is always reached, and it drops out well. The length of the instrument enables the operator to avoid too close contact with the flank and thigh of the horse. Reimer thinks that the compression castrator (similar to the "Reliance" and "Huish-Blake") checks hæmorrhage more effectually than the emasculator.—*Berliner tierärzt. Woch.*

A CASE OF ROARING AS A RESULT OF A PRIMARY TRACHEAL SARCOMA.

By PROFESSOR KÄRUBACH, BERLIN.

THE author asserts that hitherto primary tracheal sarcomata in the horse have been very rarely noticed, and that a primary tracheal sarcoma has never been the object of veterinary examination. A healthy horse had made a whistling sound for two years at hauling work. The usefulness of the animal was not at first impaired. The following year the whistling sound increased in strength, there was difficulty in breathing, and the animal repeatedly came to a standstill.

As catarrh of the air passage developed in addition the horse roared and the difficulty in breathing became so intense at work that suffocation threatened. Since tracheotomy produced no benefit a tumour in the trachea was suspected. This suspicion was verified by passing a sound, and at the autopsy microscopic examination showed a large round-celled sarcoma that had its origin in the region of the submucosa. The benignness of the tumour accounted for the small affection of the neighbourhood and the slow growth (two years).
—*Deutsche tierarztl. Woch.*

Canine and Feline Clinicals.

UNSUSPECTED FRACTURE OF THE ATLAS IN A CAT.

By E. B. REYNOLDS, M.R.C.V.S.

Professor in the Royal Veterinary College, London.

THE following case appears worthy of being recorded, if only for the fact that such a serious and long-standing lesion as was revealed at the *post-mortem* examination had been unaccompanied by any noticeable symptoms until so late on in the condition.

The subject was a one-year-old castrated male cat. The history was that about seven weeks previously a small abscess had formed just behind the right ear; this had been opened and dressed, but at no time had the wound quite healed. The cat had always appeared to be in good health, and quite playful up to two days before being brought for treatment. It was then noticed that it had some difficulty in standing; it rapidly became worse. The cat on examination was found to be in a semi-comatose condition, and quite unable to make any movement or support itself in any position whatever. About three-quarters of an inch behind the base of the right ear, and at a point situated about the middle of the outer edge of the wing of the atlas, was a small opening through the skin just large enough to admit a small silver probe. This could be passed inwards and slightly upwards to the inner part of the anterior edge of the wing. No bare bone could be detected, but on withdrawing the probe a drop of dark-coloured pus escaped, this having the characteristic smell of necrotic bone.

A definite diagnosis was not attempted, but from the acute symptoms present it was apparent that, whatever the bone lesion,

the spinal cord was seriously involved, so destruction was advised.

Post-mortem examination showed that a fracture of the atlas had taken place some time previously. The lower half of the right articular cavity, which consists of a thin shelf of bone, had been completely broken away; this piece of bone, a quarter of an inch long and eighth of an inch wide at its middle, had become necrotic, and was no doubt responsible for any subsequent lesions. The whole right half of the atlas, including the wing, was the seat of an extensive rarefying osteitis with some degree of bulging into the neural ring. There was considerable ossific deposit on the occipital bone to the outer side of the right condyle and along the under surface of the basilar process; the lower half of the right condyle, corresponding to the detached part of the articular cavity of the atlas showed ulceration, the articular cartilage having disappeared from its surface; suppuration had extended just into the neural canal through the occipito-atlantal ligament, setting up an acute inflammation of the structures surrounding the spinal cord. It is likely that this extension to the neural canal was of recent occurrence, and accounted for the onset of the serious symptoms.

After discovery of the exact nature of the lesion further inquiries were made of the owner as to the presence of any earlier symptoms. He again stated that none whatever had been noticed, and that as the cat had been a constant pet they would have been observed had they occurred.

A CASE OF DELIBERATE SUICIDE IN A DOG.

By J. BENSON.

A NUMBER of cases of deliberate suicide in animals have lately been reported in the lay papers, and although I am not a veterinary surgeon, I have lived all my life amongst animals, and am not hysterical about them, so thought that perhaps the readers of THE VETERINARY JOURNAL would be interested in the following fact of which I was an eye-witness.

The subject was a smooth-haired collie bitch, the property of a yeoman farmer, and was suffering from a very painful affection of the ears, accompanied by constant discharge.

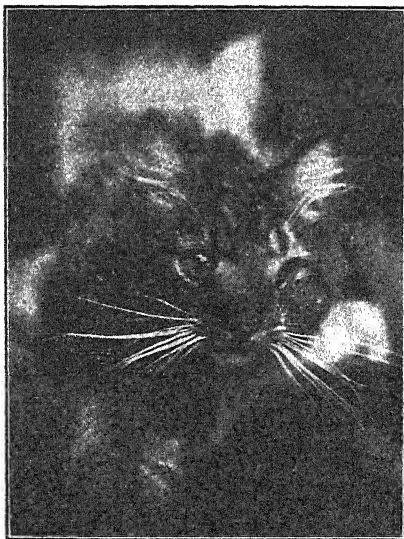
I saw her myself deliberately walk into a pool, and hold her head under the surface of the water until she was drowned. I did not understand her peculiar action until it was too late to attempt to save her.

A TUMOROUS SWELLING ON THE NOSE OF A CAT.

By GUY SUTTON, F.R.C.V.S.

Kensing'ou, W.

THE photograph is that of a three-year-old male cat, on whose face a small swelling was first noticed about six months ago, the owner attributing it to be the result of a rat bite. From the onset the growth of the enlargement was slow but regular, and when brought for advice in October the swelling had reached the size of half a walnut, and the face was distorted, as shown in the photograph.



The clinical picture the animal presented was identical with that shown on p. 89 of Hobday's "Clinical and Feline Surgery," which was identified microscopically as a granuloma. Unfortunately, permission to remove a portion for examination could not be obtained, as the cat was such a great pet.

CARCINOMA OF THE ŒSOPHAGUS OF A CAT.

By GEO. H. WOOLDRIDGE, F.R.C.V.S.

Professor in the Royal Veterinary College, London.

THE subject of this note was an aged female tabby cat, which was brought to the College in a very weak and emaciated condition. The owner was of opinion that there was a bone stuck in the throat or gullet. Although the cat had been wasting for a considerable time, she had suddenly got much worse, and was unable to swallow solid food. When she attempted to take liquids, such as milk, she was unable to retain them. On examination there was no obstruction to be found in the mouth or pharynx, nor could any obstruction be found at first in the cervical portion of the œsophagus. A probang was then passed, and some obstruction was encountered at the base of the neck about the level of the two first ribs. On more thorough manipulation a firm, apparently flexible body, could be felt in this position, and, as the owner intimated that the last solid meal partaken of by the cat consisted of haddock, it was suspected that the obstruction was probably a fish-bone. Œsophagotomy was accordingly recommended, and permission to operate was given, the owner being informed of the danger of collapse under the anæsthetic, as the cat was almost in a collapsed state already.

The animal was anæsthetized with A.C.E. mixture in the sterno-abdominal posture, the hair having been removed from the site of operation. She was then turned over, and the necessary area disinfected with pure tincture of iodine. An incision was made about an inch long, and the deep structures of the neck exposed. The œsophagus was difficult to identify, and the probang was re-inserted in order to facilitate identification. The gullet was then incised and the obstruction partly exposed. It was found not to consist of a foreign body, but was in the nature of a new growth. A probe could be passed alongside it down the gullet, but the channel was almost occluded. The growth had a broad diffuse base, and consequently could not be excised; moreover, for most of its extent it was in an inaccessible position. It was decided to remove it by means of the curette and this was done sufficiently to allow the probang to pass freely into the stomach. After disinfection the wound was closed by means of a single row of

fine silk interrupted sutures in the œsophageal wall, and stronger sutures through the skin. The cat withstood the anæsthetic better than was anticipated, but it was not expected that she would recover from the operation owing to her weak condition. She died twenty-four hours later.

A *post-mortem* examination was made. The body was in an extremely emaciated condition, probably due to the animal being unable to swallow food, and on exposing the interior of the œsophagus it was found that the growth had occupied a base about an inch and a quarter in diameter in the commencement of the thoracic portion, and that sufficient of it had been left to permit of sections being cut for microscopic examination. No other tumour formation was observed elsewhere in the body, but the liver was the seat of chronic venous congestion, and fatty infiltration. On microscopic examination the growth was found to be carcinoma, a condition which in my experience is extremely rare in the cat in this situation.

SOME CANINE CLINICAL NOTES.

By FREDERICK HOBDAV, F.R.C.V.S.

Kensington, W.

FRACTURE OF EACH HUMERUS AT THE SAME TIME.

THE subject was a black and tan Manchester terrier bitch, five months old, and was stated by the owner to have sustained the injury by having jumped off a table.

Symptoms.—The typical position for fractured fore-legs, *viz.*, sitting upon metatarsals like a kangaroo, with fore-legs hanging between hind pads.

Diagnosis.—Fracture of distal end of each humerus.

Prognosis.—Favourable, but probable stiff legs as a sequel.

Treatment.—Fractures set in gum bandages, and bitch ordered to be kept quiet and fed on rice and bread and milk.

Ten days afterwards the bandages were removed, but as the fractured bones still crepitated the legs were re-bandaged.

Three weeks later the dog brought up for inspection, and the bandages were removed. One fracture had united, the other still needed support, and was re-bandaged. Ultimately both made a good recovery.

TWO CASES OF RANULA.

Case 1.—A spaniel 1 year old.

Case 2.—A Newfoundland 3 or 4 years old.

In each case the mouth was open, and saliva was escaping freely.

History.—Each dog had difficulty in swallowing, which increased, till at last no solid food could be taken. The spaniel's ranula had formed to the size of a small walnut in about four days.

Examination revealed a large fluctuating swelling under the tongue in each case.

Each dog was hobbled, chloroformed, and the ranula lanced, when ropy saliva and mucus exuded from it. About half of the lower wall of the cyst was removed with a pair of curved scissors, and the mouth washed out with a solution of boracic acid.

After-treatment consisted in the administration of pot. iod., with applications of alum and boracic acid as a mouth wash three times a day.

Ropy saliva continued to flow in *Case 1* for a week, and in *Case 2* for about three weeks, but each eventually made an excellent recovery.

A CASE OF DOUBLE INTUSSUSCEPTION.

The subject was a black and white Pomeranian bitch, one month old, which was observed to be ill one night, with others of the litter (which were afterwards treated for distemper), and died the next morning after admission to hospital.

Post-mortem revealed two intussusceptions of the large intestine, each about 1 in. in length and about 3 in. from each other. Three large worms (*Ascaris marginata*) were found in the stomach.

SUCCESSFUL PASSAGE OF A LARGE FISH-HOOK THROUGH THE
INTESTINE.

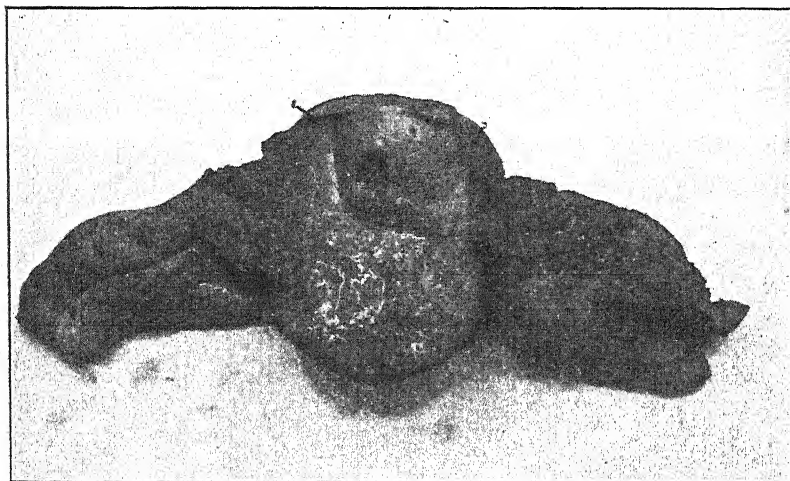
Early in the month a client wrote for advice regarding a fox-terrier puppy about five months old, which had swallowed an ordinary eel fish-hook rather more than an inch in length.

A dietary consisting entirely of suet pudding was given, and the hook was passed in a natural manner about forty-eight hours after being swallowed.

A CASE OF SARCOMA OF THE INTESTINAL WALL.

Recorded cases of sarcoma in the tissue of the wall of the intestine are not common, but when they do occur they are invariably fatal.

The patient in this case was a poodle bitch about 9 years old, for which veterinary aid was sought on account of persistent attacks of sickness. These were generally got under control with doses of bismuth, but always returned, and the dog's appetite now became very capricious. As there was a considerable amount of pyorrhœa the teeth were attended to, several being extracted, and the gums dressed with astringent lotion. For a week the dog was decidedly better, but diarrhœa set in as a complication,



Small-celled Sarcoma of the Intestine of a Dog.

and this could not be checked. Finally Mr. Willett, M.R.C.V.S., was called in consultation, and eventually, as the animal was becoming thinner and evidently in pain and very miserable, it was destroyed.

Post-mortem examination revealed the presence of a tumour about the size of a large filbert nut, with an ulcerating centre, embedded in the wall of the first part of the large intestine, the growth penetrating the whole thickness of the wall.

Microscopical examination revealed the structure to be that of a small round-celled sarcoma.

AN INTERESTING MONSTROSITY.

The monstrosity which is here depicted by the sketch is one which was brought to me by a client and was brought into the world by a black and tan terrier bitch, being the only progeny of the service.



It is especially interesting from the point of view that there are two fetuses joined together, the whole eight legs being fully developed on the one body, and both are females. The

latter seems to be an invariable rule, and on the authority of Sir John Bland Sutton, F.R.C.S. I understand that the fact of the two bodies joined together being always of the one sex is invariable. Here the particular peculiarity is that the fore legs of the second body are attached to what ought to be the nose and nostrils of the first, and also that there is only one set of internal organs to the two.

The specimen is now in the hands of Dr. Shattock and will be preserved in the Museum of the Royal College of Surgeons, Lincoln's Inn Fields, where it can be examined by anyone who cares to see it in its entirety.

AN INTERESTING CASE OF ASCITES.

The patient, a fox-terrier, 14 years old, a very great favourite, first began to show signs of an enlarged abdomen in November, 1911, and we were called in on December 1. Ascites was diagnosed, and nearly two quarts of fluid were removed from the abdomen. The old dog had asthma very seriously, and was in too much discomfort to sleep or even to lie down before the operation. Instant relief was obtained after the fluid had been removed, and the patient passed a quiet night. Potassium iodide was prescribed internally, together with quinine, and all went well until the 19th, when the fluid had accumulated again to a point of discomfort, and the trocar was used with the same beneficial effect as before. Between December, 1911, and August, 1912, the abdomen was tapped, either by my partner, Mr. Sutton, F.R.C.V.S., or myself, no less than twenty-one times, amounts varying from one and a half to four pints being taken away each time. Relief was always immediate, and when death did come it came suddenly after a coughing fit, apparently from syncope.

At no time was there any evidence of peritonitis as a result of the tapping, and this point is of interest as an illustration of the absolute fearlessness with which one may enter the abdomen if only antiseptic details are attended to.

In this case the trocar was always carefully boiled, and the skin painted with tincture of iodine on, and after, each operation.

Report.

TENTH INTERNATIONAL VETERINARY CONGRESS, LONDON, 1914.

At a meeting of the Organizing Committee, held on Friday, October 11, 1912, the following titles of subjects for discussion at the Tenth International Veterinary Congress (to be presented for consideration to the Permanent International Commission at Lyons) were agreed to:—

GENERAL MEETINGS.

Foot-and-Mouth Disease.—Tuberculosis.

SECTION I.

Veterinary Science in relation to Public Health.

- (1) Meat poisoning—its pathogenesis and the measures necessary to guard against it.
- (2) General principles to be observed in the inspection of the carcasses and organs of tuberculous animals with a view to determining their safety as articles of human food.
- (3) Public control of the production, distribution, and sale of milk in the interests of human health.
- (4) Disinfection of wagons.

SECTION II.

Pathology and Bacteriology.

- (1) Johne's Disease.
- (2) Bovine Piroplasmoses (European), with special reference to their etiology.
- (3) The relationship of the so-called types of tubercle bacilli.
- (4) Ultra-visible viruses.
- (5) Distemper—etiology and vaccination.

SECTION III.

Epizootiology.

- (1) Anthrax.
- (2) Abortion.
- (3) Swine Fever.
- (4) Glanders.

SECTION IV.

Veterinary Medicine and Surgery.

- (1) Anæsthesia—local and general.
- (2) Laminitis.
- (3) Roaring in horses.
- (4) The use of drugs in the treatment of diseases caused by nematode worms.
- (5) Sarcoptic mange in horses.

SECTION V.

Tropical Diseases.

- (1) The piroplasmoses (excluding redwater).
- (2) Methods of dealing with ticks concerned in the transmission of disease.
- (3) Trypanosomiasis of animals.

Review.

Veterinary Physiology. By Major-General F. Smith, F.R.C.V.S., C.B., C.M.G. Fourth Edition, revised and re-written. Demy 8vo, pp. xii + 808. 259 illustrations, including one coloured plate. Price 18s. net. Published by Baillière, Tindall and Cox, London.

Although this is the fourth edition of General Smith's work on Veterinary Physiology, it represents so many new features, having been almost entirely re-written, that more than passing mention is necessary. The number of pages has been increased by nearly one hundred, and the type has been set so much closer that the book contains almost double the matter of the previous editions, and yet the volume is only about the same size. The subject is dealt with in the same order as in previous editions, and the chapters correspond.

It is not possible, nor indeed is it necessary, to criticize the work in detail, and it would be invidious to pick out one part for special mention when all is so excellent. In this edition General Smith has given us of his best, and we have no hesitation in recommending all who possess even his third edition to invest still further, and procure this, the fourth edition, in which the various phases of Veterinary Physiology have been brought right up to date.

There are several points, however, to which we should like to refer. One of these is in reference to the nature of the so-called "blood platelets." At the present time, when the examination of blood in the investigation of hæmatozoic affections is being pursued, it would appear to us advisable that a little more attention might with advantage have been paid to these bodies. The author appears to support the view that "blood platelets" are distinct cellular elements, and very little is said with regard to other theories concerning them. One important theory held by Buckmaster and others is that "blood platelets" represent one of the first stages in the process of coagulation, and that they do not exist as distinct elements in normal blood. He considers that they occur only in blood coagulating very slowly, and when seen in microscopic preparations they should be regarded as artefacts. It would perhaps be an advantage if this matter were discussed a little more fully.

The section dealing with internal secretions is more comprehensive than in previous editions, and the functions of the pituitary body are dealt with more fully. There is, however, a probable function associated with this body to which reference is not made, and that is with regard to its possible association with the functions of the generative apparatus. It has been ascertained clinically that extracts of the bulbar portion of the pituitary body exert a marked influence on the contractions of the uterine wall in cases of prolonged parturition. We do not know how this effect is brought about, but there would appear to be no doubt about the association of the pituitary secretion with the contractions in labour. The chapter on locomotion has been enlarged and new excellent diagrams introduced.

Two other useful additions in this volume refer to the influence of age in horses on the capacity for work, and in the section on ferments in the latter connection there is a very useful and interesting table summarizing the various ferments employed in digestion and nutrition, where they are found, and their actions.

Following the index, which is very comprehensive, is a list of authorities quoted in the text. There is also a list of *corrigenda*, to which might have been added the correction of the word *attending* for *attending* on page 192, line 33.

The work of the publishers in the production of the volume is all that can be desired.

G. H. W.

LITERARY NOTE.

MESSRS. BAILLIERE, TINDALL AND COX announce that they have just published an English translation of Huttyra and Marek's "Special Pathology and Therapeutics of the Diseases of Domestic Animals."

The merit of this work is proclaimed by the fact that it has, in its original form, passed through three editions in two years, and has been adopted as a text-book by the Veterinary Colleges of Germany, Austria, and Hungary. It has also been translated into Italian, and a Russian edition is in preparation. The Veterinary profession at home is under a debt of gratitude to the translators, Drs. John Möhler and Adolph Eichhorn for having made such a work more readily accessible.

It will be in two large octavo volumes, comprising 2,300 pages, with about 400 illustrations, many of which are coloured, and the price complete will be £3 3s. net. Only the first volume is ready at present. It treats of the infectious diseases, diseases of blood and of the hæmatopoietic organs, disease of metabolism, of the spleen, urinary. and circulatory organs. The advance orders for this book in America have been so unexpectedly numerous that the supply now available is limited, and prospective purchasers should order at once if they do not wish to be disappointed.

Miscellaneous.

ROYAL COLLEGE OF VETERINARY SURGEONS.

FELLOWSHIP DEGREE.

A MEETING of the Board of Examiners for this degree was held at the College, 10, Red Lion Square, W.C., on Saturday, December 7. The following is a list of the successful candidates, together with the title of their respective theses:—

Lieutenant R. F. Stirling, "East Coast Fever in Rhodesia, and its Control"; Mr. R. G. Anderson, "Inflammatory Diseases affecting the Udder of the Cow."

The examiners were Messrs. J. Malcolm, W. Hunting, Professor Macqueen; Mr. W. J. Mulvey being in the chair.

FRED BULLOCK, *Secretary*.

EXAMINATIONS IN LONDON.

At the examinations held in London in December, the following gentlemen passed their Final Examination, and were admitted Members of the Royal College of Veterinary Surgeons:—

Mr. J. Bradley	Mr. W. E. Petty
„ S. E. Hill	„ E. M. Robinson
„ C. J. R. Lawrence	„ S. L. Slocock*
„ R. A. Murless	„ P. L. Thierry
„ W. F. Poulton	„ S. H. L. Woods

The following gentlemen passed their Third Examination:—

Mr. A. H. Adams	Mr. G. F. Marais*
„ W. P. S. Edwards	„ B. J. W. Nicholas
„ R. C. G. Hancock	„ M. G. J. O'Connell
„ W. B. Howe*	„ W. H. Priston
„ G. C. Harding*	„ H. A. Thorne
„ H. A. King	„ H. S. Wright

The following passed their Second Examination:—

Mr. J. Daly*	Mr. P. S. Sparling
„ J. A. Edwards	„ J. H. Stewart
„ R. W. D. Easom	„ G. Simons
„ T. S. Roberts	„ K. S. Simpson

The following passed their First Examination:—

Mr. H. W. Brekke	Mr. A. Temple
„ G. H. Bennet	„ T. H. A. Turner
„ L. St. Bel. Gollledge	„ P. F. Woodland
„ J. F. Hedley	

Marked thus () passed with Second-class Honours.

EXAMINATIONS IN DUBLIN.

The following gentlemen passed their Final Examination and were admitted Members of the Royal College of Veterinary Surgeons:—

Mr. T. G. Carroll	Mr. T. F. Quirke
„ W. L. Flanagan	„ P. J. Shiel
„ M. J. Glynn	„ W. P. Walsh
„ M. McClancy	„ R. C. Wheeler
„ W. H. Power	

The following passed their Third Examination:—

Mr. A. E. Brandon	Mr. E. S. M. Morgan
„ T. D. Condell	„ M. H. Reid
„ P. D. Huston	„ J. Shannon
„ J. C. P. McFarlan	

The following passed their Second Examination:—

Mr. T. A. Connolly	Mr. R. Haws
„ G. J. Delaney	„ G. K. Shaw
„ M. J. Flynn	

The following passed their First Examination:—

Mr. E. J. Allen	Mr. D. Mahony
„ S. J. Cotton	„ C. O'Driscoll*
„ J. M. Currie	„ M. McCartin
„ J. Leigh	

EXAMINATIONS IN GLASGOW.

At a meeting of the Board of Examiners held in Glasgow on December 9, for the Written, and on December 11 and 12, for the Oral and Practical Examinations, the following gentleman passed his Final Examination:—

Mr. P. J. Turner.

The following passed their Third Examination:—

Mr. Q. A. Stewart	Mr. E. Angler
„ W. Barr	

The following passed their First Examination:—

Mr. H. J. Hughes*	Mr. C. McPherson
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LIVERPOOL (EXAMINED AT GLASGOW).

The following passed their Third Examination:—

Mr. M. W. Holland	Mr. R. L. Lewis*
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The following passed their First Examination:—

Mr. E. W. Hughes*	Mr. W. L. Marshall
-------------------	--------------------

Marked thus (*) passed with Second-class Honours.

EXAMINATIONS IN EDINBURGH.

At a meeting of the Board of Examiners held in Edinburgh on December 9, for the Written, and on December 11, 13, and 14, for the Oral and Practical Examinations, the following gentlemen passed their Final Examination:—

Mr. J. N. Cooper	Mr. A. Q. Hall
„ W. Dalling	„ S. E. Holmes
„ R. L. Armour	„ C. Nicholson
„ F. J. L. Croudace	„ D. R. Williamson
„ R. E. Drennan	

The following passed their Third Examination:—

Mr. L. Anderson	Mr. E. Sewell
„ D. Starkey	„ G. Williamson

The following passed their Second Examination:—

Mr. R. E. Bond	Mr. W. J. Bambridge
„ R. J. Forrest	„ P. MacLaughlin
„ P. W. Walker	„ L. Littler

The following passed their First Examination:—

Mr. R. Beattie	Mr. J. G. E. Gallie
„ H. F. Downie	„ A. B. Kerr

EXAMINATIONS IN LIVERPOOL.

At a meeting of the Board of Examiners held in Liverpool on December 9, for the Written, and on December 16 for the Oral and Practical Examination, the following gentlemen passed their Final Examination:—

Mr. V. A. Bartrum	Mr. A. L. Pollard
„ R. Isherwood*	„ J. W. Procter
„ A. D. Morgan	

Marked thus * passed with Second Class Honours.

UNIVERSITY OF LONDON.

Faculty of Science (Veterinary Science).

GENERAL INTERMEDIATE EXAMINATION (PART II) FOR
INTERNAL STUDENTS.

PASS LIST, 1912.

- 1801. Grey, Gerald Omar Rushie, Royal Veterinary College.
- 1802. Hancock, Reginald Cuthbert Greatrex, Royal Veterinary College.
- 1803. Horton, Frank Fielding, Royal Veterinary College.

1804. Marais, Guillaume François, Royal Veterinary College.

1805. Minett, Francis Colin, Royal Veterinary College.

Examiners.—Veterinary Physiology: G. A. Buckmaster; W. L. Symes.

B.SC. EXAMINATION FOR INTERNAL STUDENTS.

PASS LIST, 1912.

1901. Edwards, James Thomas, Royal Veterinary College.

1902. Horton, Frank Fielding, Royal Veterinary College.

1903. Minett, Francis Colin, Royal Veterinary College.

Examiners.—Veterinary Hygiene: G. H. Wooldridge. Veterinary Pathology: John McFadyean; A. E. Mettam.

Letters and Communications, &c.

The Registrar of the Royal Veterinary College of Ireland: Dr. Ireland; Mr. L. Edwards; Mr. J. A. Jordan; Mr. A. E. Roberts; Mr. A. Routledge; Mr. S. J. Motton; Professor Reynolds; Mr. G. Sutton; Mr. J. Benson; Professor Antonini; Professor Liautard.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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SIR STEWART STOCKMAN, M.R.C.V.S.

Chief Veterinary Officer to the Board of Agriculture and Fisheries.
Formerly Professor of Pathology and Bacteriology in the Royal (Dick) Veterinary
College, Edinburgh ; and afterwards Veterinary Adviser to the Transvaal Government.

THE VETERINARY JOURNAL

FEBRUARY, 1913.

SIR STEWART STOCKMAN, M.R.C.V.S.

THAT Professor Stockman should be knighted at the present moment is an honour which the profession will welcome, both on account of the fact that the recipient is a deservedly popular man amongst his colleagues, and because it is an appreciation of the value of the services of the Veterinary side to the Department of Agriculture and Fisheries.

The recent scare caused by the appearance of foot-and-mouth disease in Great Britain has given the Board of Agriculture an opportunity to prove to all breeders of cattle the necessity for its existence, and, although sufficient time has not yet elapsed to be too sure that we are "quite out of the wood," yet the energetic manner in which it has been got under control is deserving of the highest praise. Born in 1869, Sir Stewart Stockman is a native of Edinburgh, and graduated with honours from the Royal (Dick) Veterinary College, where he became assistant to Professor (now Sir John) McFadyean in the Department of Pathology. In 1892, when this gentleman was appointed Principal of the London College, Mr. Stockman was selected as Professor of Pathology and Bacteriology, a position which he occupied until the Boer War, when he volunteered for South Africa, and was present in several engagements, receiving a medal and four clasps. He then went out to India under the Civil Veterinary Department, remaining, however, only twelve months before he was offered the position of Veterinary Adviser to the Transvaal Department of Agriculture, from which, two years later, he returned to England as Chief Veterinary Officer to the Board of Agriculture and Fisheries.

Of his work here the profession in England is well acquainted, and that the difficulties in the way of eradicating such plagues as glanders, swine fever, tuberculosis, anthrax, distemper, con-

tagious abortion, and many others out of the country may not be insurmountable is their wish. Whatever may happen, the veterinary and agricultural communities feel that they may with confidence rest assured that nothing will be left undone which is likely to promote their general welfare, and to protect the flocks and herds from the ravages of disease.

Editorials.

THE VETERINARY PROFESSION AND THE PUBLIC SERVICES.

ON August 30 last a Committee, of the utmost importance to the members of the Veterinary profession, was appointed by the President of the Board of Agriculture and Fisheries "to inquire into the requirements of the Public Services with regard to the employment of officers possessing veterinary qualifications, and to consider whether any further measures can with advantage be adopted for the selection and training of students with a view to such employment."

This Committee examined a number of witnesses respectively chosen as representative of the Government services, the teaching colleges, the diploma-granting body, the Universities, the private practitioner, and the Colonies.

This examination was spread over several months, and the questions and answers will be published shortly in full, the conclusions arrived at being summarized on page 86 of this month's issue. The result was satisfactory in more ways than one, for it is the first time that the profession has been considered of sufficient importance to have its affairs inquired into and its efficiency for any sudden emergency granted.

When compared with the public services rendered to the State, and paid for by the State, in other countries, the Veterinary Public Health Official can scarcely be said to exist in England; and, in so far as research work is concerned, by far the major part of it is done by private enterprise and at private expense. Even the Colleges are miserably supported both in funds and in opportunities for work, and altogether it is time that something is done.

The future chances for a brilliant student have for a long time been marred in the majority of instances by the fact that as soon as the diploma was obtained he had to earn his daily bread, but by the institution of scholarships, both during the College career and for post-graduate study, this will be very greatly altered, and

men of the highest scientific attainments will be induced to join and work for the profession.

In the words of the summary of the findings of the Committee, "The number of suitable candidates for appointments in the public services is inadequate," and a further conclusion arrived at speaks promisingly for the future, as we read: "That a largely increased number of veterinary officers possessing special qualifications will be required for the Public Services."

Numerous scholarships are recommended for the student and for the newly-fledged graduate, and State aid is recommended for the teaching schools; and in this latter respect the Committee are wise, for it is utterly impossible for private institutions such as exist in Great Britain to compete, as at present constituted, either in laboratory or clinical research, with the great Government-aided veterinary schools of other European countries, and everyone amongst us knows, and has regretted at some time or other, that on account of the want of this pecuniary aid the English veterinary profession has often been compelled to act the part of a follower instead of giving a friendly lead to its *confrères* in other countries.

The Departmental Government inquiry will, if its recommendations are carried out, give a fresh lease of life to a profession whose ranks and pockets have lately been terribly thinned by the advent of motor traction and the consequent loss of tens of thousands of former patients. Our especial thanks must ever be due to the present President of the Board of Agriculture and Fisheries, Mr. Walter Runciman, for having instituted and carried out the inquiry.

THE "PURE MILK" BILL AND THE RELATIVE RESPONSIBILITIES OF DAIRYMEN AND BUTCHERS.

WE are very glad to see that Mr. John Burns has re-introduced his Milk and Dairies Bill, and we sincerely hope that facilities will be given for it to be passed into law in the near future.

The main objects of the Bill are summarized in the Memorandum as follows: To provide for the more effective registration of dairies and dairymen; the inspection of dairies and the examination of cows therein; the prohibition of the supply of milk from a dairy where such a supply has caused or would be likely to cause infectious diseases, including tuberculosis; the prevention of the sale of tuberculous milk; the regulation of the importation of milk so as to prevent danger to public health arising

therefrom; the issue of regulations for securing the supply of pure and wholesome milk; the establishment by local authorities in populous places of milk depôts for the sale of milk specially prepared for infants.

Obviously it is directed in the main against the possible transmission of tuberculosis from cows to human beings, particularly infants, by means of milk, and one of its clauses especially provides for "the establishment by local authorities in populous places of milk depôts for the sale of milk especially prepared for infants." But why limit this provision to "populous places," which presumably applies to the larger towns and cities? Do not the infants of the villages and smaller towns require similar protection?

We are glad to see that attention is being directed to imported milk, for this is a growing branch of the industry, and as a possible source of danger to the public health must not be neglected.

In the Bill it is apparently recognized that the veterinary surgeon is the only person fitted by training and experience to examine cows, and if by any chance it should be considered that anything is lacking in this respect, no doubt it will be pointed out and remedies suggested by the Committee now inquiring into the question of the training of veterinary inspectors.

A very important paragraph says: "The Board of Agriculture and Fisheries propose to issue an Order under the Diseases of Animals Act, 1894, dealing with tuberculous cows, and providing for the payment of compensation in cases of slaughter by the local authority. The Treasury are prepared, subject to the assent of Parliament, to sanction the payment from the Exchequer of one-half of the net amount paid by way of compensation for a period of five years."

It appears therefore to be the intention of the authorities to compel the slaughter of cows yielding milk infected with tubercle bacilli, and certainly any other action would be absurd. We have often pointed out the absurdity of the limited powers at present possessed by some local authorities by which they can prohibit the sending of such milk into their districts, although they have no power to order the slaughter of the offending cow or cows. A farmer not desirous of submitting to the total loss of his cow by voluntarily slaughtering her may simply sell her in open market to continue her virus-spreading career in another district. Very few farmers will object to the slaughter of such cows if they are to receive some reasonable compensation, and such compensation should certainly be in the main a National and not a local charge. Moreover, it will result in an enormous

benefit to the farmers themselves who do not sufficiently realize the fact that tuberculosis of cows in the early and unsuspected stages is responsible for great fluctuations in milk yield and corresponding monetary loss.

We welcome this principle of compensation also as a matter of principle, for it must logically be followed by similar compensation to butchers and meat salesmen for carcasses seized when the persons involved can prove that they had paid fair prices for wholesome animals and the diseased condition could not possibly have been detected until after slaughter. That butchers should be prosecuted and dairymen compensated for analogous offences would be quite Gilbertian were it not such a serious matter. In our opinion, only by the co-operation of dairymen and butchers with public health authorities can the success of this great scheme be assured, and these two branches of the food industry should be treated on similar lines. Notification of suspected animals or carcasses should be encouraged by the offer of compensation and immunity from prosecution; but, on the other hand, any proved evasion or attempts at evasion of such responsibility should be met by severe penalties.

G. H. W.

A GOVERNMENT VETERINARY RESEARCH INSTITUTE.

WE understand that Mr. Runciman, President of the Board of Agriculture and Fisheries, proposes shortly to submit a proposal to the Development Commissioners for the establishment of a research institution for the investigation of diseases of animals. This is a most important step in the right direction. Far too little has been done in the British Isles in this direction. Most of the investigations into animal diseases in this country have been done by private institutions, and in the few instances where Government assistance has been given advantage has had to be taken of private institutions for the purposes of investigation. This is not as it should be, and we trust that a research institute, creditable to the country, will be established, and that such salaries will be offered to the director and other principal workers as will ensure the best men being obtained for the posts.

General Articles.

THE PATHOLOGY OF MILK FEVER.—A PLEA FOR FURTHER INVESTIGATION.

By W. M. SCOTT, F.R.C.V.S.

Bridgwater.

FOR the great discovery of the principle of treatment which bears his name, the cattle-raising community owe Schmidt an everlasting debt of gratitude.

Not only has he given us a practically infallible cure for this bovine scourge, but as a clinician he has paved the way to the pathologist in his endeavour to demonstrate the *causa causans* of this disease. Has the latter succeeded? Up to the present it appears he has not. In short, therapeutically and clinically, we have made great progress; pathologically and scientifically we are little better than empirics. We know if we inject gas, air, or fluids into the mamma of a milk-fever subject we will get a restoration to a normal condition, but why we do so remains an uncertainty. We have here, in fact, another illustration of practice preceding science. In the pre-Schmidt days many theories were put forward, and of recent years some have been either modified or dropped altogether. When the oxygen treatment was adopted, the suggestion was made that the origin of the disease was a microbe in the udder, which could not live in the presence of oxygen (anaerobe). Others held that a bacillus of the coli group, and incubated in the uterus, was the actual cause. Of those who uphold the germ theory one must ask: how could a disease manifesting itself by grave functional derangements, subside as suddenly under suitable treatment as it appeared, and leave not the slightest vestige of organic trouble behind it? This is contrary to the most benign form of microbial invasion. Even where the nasal mucous membrane is invaded by the least harmful cocci or bacilli, commonly found in catarrh, and producing no constitutional disturbance, such an invasion may compel nature to supply a new mucosa to the nasal chamber and take a week to run its course. How much more, then, a microbic invasion of the sensitive milk tubules, forming in themselves an admirable incubator for the growth and development of the germs in

question and their secretion or excretion of a specific toxin capable of producing the gravest symptoms possible, and in many cases causing dissolution, and yet leave no organic complications behind! More reasonable is the milk toxin theory, and by those who hold this view it is supposed a specific poison is liberated in the udder itself, I presume while in the performance of its metabolic functions. I venture to suggest, in the light of our present-day experience, this theory leaves a great deal to be desired. Why should a perfectly healthy animal, with a perfectly normal udder, in its physiological processes manufacture a pathological by-product, *i.e.*, a toxin? Nay, more, the more healthy and robust an animal is, the more liable she is to milk fever, and *vice versa*. Any condition which removes a milk fever subject from the normal healthy standard reduces the risk of her developing the disease to a minimum. I have noticed the retention of the placenta, mammitis, difficult parturition, eversion of the womb, and even premature birth, appear to act as preventatives to milk fever. Reasoning from analogy, one would say that if the cause of this disease is a toxin, the fact of the system being already lowered by disease or derangement, and the protective forces enfeebled, the toxin-producing cells would proportionately increase; but, as already stated, such is not the case.

Of course, one knows sometimes that normal physiological cells take on pathological functions, *viz.*, neoplasms; but in the milk fever patient there is not the slightest vestige of organic mammary trouble, nor does there appear to be a very excessive cell proliferation going on. Again, if a specific toxin has been formed in the udder, before the grave cerebral and constitutional disturbance can take place, absorption must result into the bloodstream, for no organ of the economy escapes this disturbance. It must, therefore, follow that if the cause is a toxin, inflation of the udder must act not only in the suppression of a further supply of toxin in the udder itself, but it must also neutralize the toxicity of the poison already absorbed and circulating freely in the blood. For the former condition the mechanical influence of pressure would be logically understood; for the latter, however, no chemical law can satisfactorily explain how air injected into the mamma can neutralize a toxin flowing in the blood, which is in itself capable of producing such grave constitutional

disturbance. What, then, is the active cause of milk fever? That there is a well-defined cause at work, considering the more or less constant nature of the symptoms, I think all will agree. From records of observations gathered from nearly a thousand cases, I have come to the conclusion that *primâ facie* it is a circulatory disturbance. In every case at the outset there is a high cardiac and arterial blood-pressure, and a probable increased tension in the peripheral arteries and veins. Of course, one must remember that this disease is the production of generations of artificial forcing on the part of the stockowner, in his endeavour to obtain the maximum of milk in the minimum of time. Moreover, the milchy strains are well preserved, forced, and bred from, so that it must follow that heredity plays an important part as a contributing cause of milk fever. And I opine the higher blood-pressure an offspring inherits from its progenitor, the greater the flow of milk, therefore, the higher the blood tension, the more prolific the cow as a milker will be, and the more predisposed to milk fever. This statement is rather borne out by the fact that the cow does not reach the stage of milking maturity until after the third calving. From this period onward there is an increased blood tension, and the greater the tension, the greater the susceptibility to milk fever.

Perhaps it would be well to review what actually takes place in the metabolism after parturition. During the last stages of pregnancy the most vascular organ in the whole animal economy in the gravid uterus, and nearly every organ of the body is depleted for its benefit, but the depletion is so gradual and progressive that no ill effects are noticeable. Not so, however, when after an easy delivery the womb no longer requiring its normal supply of blood, shrinks, and in its shrinking process expels the blood from its matrix. Every organ of the body up to now has had enough blood for its purpose, save the udder, which now becomes progressively active, and in the process of its activity an increased flow of blood is required. I believe if a normal standard of blood supply and demand is maintained in the udder from this period onward no milk fever will follow, and the flow of milk will not only be maintained, but gradually increased. If, on the other hand, the vasodilator and constrictor centres are so upset that the supply of blood going to the udder is in excess of its requirements, a hæmatic surfeit of the milk-

producing cells takes place, followed by a pronounced depression of their normal physiological functions and the consequent interference of the secretion of milk, leading to lactic inertia. The blood-producing cells of the body are still active and a general hyperæmia follows, particularly so in the udder. By this time all the secretive organs, more or less, are suffering from a surfeit, digestion is arrested, partial paralysis of the pneumogastric largely accounts for constipation of the bowels, the liver is engorged and congested, and this may partly account for, in severe cases, disturbance of its glycogenic functions; it is more than probable, however, considering the severe cerebral tension, that sugar in the urine is established by irritation of the floor of the fourth ventricle also. As already stated the suppression of milk is noticeable, and the same applies to the suppression of urine. With all these normal functions of the body disturbed, is it not feasible to suspect at this stage a generalized and systematic auto-intoxication is established? and in my opinion it is at this stage that intoxication takes place which is the effect and not the cause of the disease. Again, if milk fever is due to the production of a mammary toxin capable of producing the grave symptoms associated with milk fever, it must follow the said toxin chemically is very virulent in character, and it is only reasonable to suspect that milk coming from such an udder cannot fail also to become contaminated with the poison. This being so, one would expect to come in touch with cases where constitutional disturbance could be traced to the ingestion of toxic milk. It may be my misfortune, but I can say candidly I have never seen such a case. I have been called to cases where the animal was lying on her side absolutely comatozed, the four quarters of the udder completely exposed, and the delicate day or two old calf having completely sucked the udder dry without the slightest visible ill-effect. I have myself drunk the milk taken direct from a milk fever subject, and also given it to others, without ill-effect. I have kept young kittens on the milk taken from a milk fever subject and noted no constitutional disturbance. Of course, these simple facts may not, to the critical observer convince him of the non-toxicity of the milk; he may argue that the natural antidotal and protective constituents of the alimentary tract has a neutralizing effect upon the toxin. To clear this point I have, however, injected 50 c.c. of milk-fever

milk subcutaneously into a full-grown cat and noticed not the slightest ill-effect. If there is such a thing as a mammary toxin, I believe it is so insignificant in the production of milk fever as to be ignored, and if it is present at all, I opine it is the effect, and *not* the cause. I venture to think that a line of thought somewhat on the following basis will be tolerated by those practitioners who have taken the trouble to interpret the more constant symptoms of this disease. As already stated, there is a circulatory disturbance after parturition. Is this to be wondered at, considering the very vascular gravid uterus, the artificially vascular mammary gland, and the complex circulatory condition of the cow's brain, *i.e.*, *rete mirabile*? As the result of this disturbance, stimulation of the vasoconstrictor centres consequent upon the blood passing through them, the blood-pressure rapidly rises, due to increased heart-beat and contraction of the muscular coat of the systemic arteries; this means, in addition, distension of the left ventricle. It is probable that the original stimulation of the vasoconstrictor centres of the brain and spinal cord is due to an excess of venous blood passing through them. This may also account in the early stages for the hurried respiration one sees, and for the same reason the respiratory centre may be stimulated. This pressure rise will be kept up until the inhibitory or dilator centres are stimulated. The heart then beats more slowly. One must also remember that as the result of excessive work the overworked and overgorged left heart becomes exhausted and relaxed, the blood-pressure falls, and before death almost as low as the surrounding atmosphere; in fact, this is one cause for dissolution in milk fever. On the other hand, the blood-pressure may rise so high before the vasodilators can act that cerebral hæmorrhage takes place, in which case the practitioner is helpless, and cannot rouse his patient out of the comatose condition. This condition answers well to the term parturient apoplexy.

HOW DOES MAMMARY INJECTION CURE MILK FEVER?

As digitalis quickens a slow heart and slows a quick heart, I believe injection of the mamma raises an abnormally low blood-pressure and lowers a high blood-pressure.

Primarily at the outset of this disease, as already stated, the blood-pressure is raised, and if the animal lives, secondarily, the

pressure is lowered. As already seen, the blood-pressure rises, one might say, almost mechanically, the vasoconstrictor and dilator centres are put out of gear, so to speak, owing to the plethora of blood from the womb caused by that organ shrinking. It must therefore follow if the womb did not shrink rapidly after calving no milk fever would follow, and, to my mind, this accounts for the fact that given a difficult calving one will get no milk fever; in short, a physiological parturition predisposes to milk fever, a pathological one prevents it. Injection of the udder produces another mechanical circulatory disturbance, and acts like the homœopathic dictum of *similia similibus curantur*.

That injection of the udder has a specific effect upon the circulation no one can deny who has taken the trouble to look into this point. I have taken the pulse at the heart during the excitable high blood tension stage, and registered 160 beats per minute; injected the udder and found in twelve minutes the pulse-beat drop to 83. In like manner during the comatose stage an imperceptible pulse will be, after injection, increased in volume and beats.

Some three years ago my attention was first directed to the *modus operandi* of mammary injection of a case we were treating in the comatose condition. We inflated the udder, got the cow on her breast, when slight indications of consciousness with visible corneal reflex was noticed. Suddenly she appeared to have a fit, rolled on to her side, eyes fixed, jaw locked, frothing from the lips, legs propped out, fixed and rigid, and head thrown back. The membranes became absolutely pale, and had it not been for this rigidity I would have diagnosed internal hæmorrhage. Artificial respiration was tried, but consciousness never returned; the voluntary muscles, however, relaxed, and the pink blood colour returned to the membranes. *Post-mortem* revealed profuse cerebral hæmorrhage. This was due no doubt to the sudden rise of blood-pressure in the brain, greater than the blood-vessels could tolerate consequent upon mammary injection.

I may add I have also had a case of enteric apoplexy, in my opinion due to the injections; while we have had several cases of hypostasis and congestion of the lungs, which I look upon not so much from mechanical inhalation of ingesta as from the effects of mammary injection. If it is possible by the injection of the mamma of air oxygen or oxygenated fluids to oxygenate

the blood, I submit we have another explanation of how udder injection acts upon milk fever. For, as already stated, it is the excessive volume of deoxydized blood which raises the blood-pressure at the outset, and, if this is true, the artificial oxygenation of the blood must facilitate a cure. In any case, for years past the routine practice we have adopted is a small injected volume of air followed up by a solution of pot. permang. and ac. boric, and finally air. The pot. permang. supplies the extra volume of oxygen; the ac. boric is the best antidote against streptococcic and staphylococcic infection, produced by artificial contamination while it appears to be well tolerated by the milk acini.

CAPRINE FREE MARTINS.*

By C. J. DAVIES.

DURING the last few years the importation of goats from abroad has been prohibited by the Board of Agriculture. The purity of the small herds of Swiss goats already established in these islands is jealously guarded, hence much inbreeding is being carried on among animals of this type.

Coincident, apparently, with this inbreeding is the birth of an ever-increasing number of kids with malformations of the genital system. Such kids are usually called "hermaphrodites" by goat breeders, irrespective of the precise nature of the peculiarity they possess. The introduction of a tendency to genital malformation seems to date back to the year 1897, when, according to a footnote in the last edition of the "Book of the Goat," three Toggenburg she-goats imported in kid by Mr. Paul Thomas gave birth to seven kids between them, one kid from each goat being a hermaphrodite. It is understood that the normal brothers and sisters of these kids were bred from and figure (sometimes in several lines) in the back part of the pedigrees of many modern goats, and the inference is that normal goats, nearly related to malformed animals, transmit the peculiarity to a proportion of their progeny—more especially when gross inbreeding is practised.

It is, of course, difficult to get from breeders an admission that a living animal is litter brother or sister to a malformed kid,

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but at least one goat at present at stud is known to come within this category; another well-known animal figures as the sire or grand-sire of a large number of recently born hermaphrodites; and a third celebrated he-goat is acknowledged to have got a large number of abnormal kids during his career, it being stated that one season *every* kid he sired, eleven in number, was a hermaphrodite. One she-goat at present living has already had two malformed kids by different sires, and a number of she-goats are known to have had at least one hermaphrodite during their career.

Inquiries made among Swiss veterinary surgeons have elicited the fact that the phenomenon "is by no means uncommon among goats" in that country, indeed one writer implies that it is more frequent in goats than in other animals, and suggests that "close inbreeding often plays an important part with regard to it. There appear, however, to be other factors which have not been cleared up which are to be blamed for it."

English goat breeders seem to think that malformed kids are not more common in one breed than another. It is a curious fact, however, that the writer has not, during a recent investigation, been able to hear of one case among animals with Nubian blood. The great majority of examples occur among pure Toggenburgs, the remainder being among what are called Swiss or Anglo-Swiss goats, usually when there is some Toggenburg blood in the pedigree. This may, of course, be only coincidence.

Allusion has often been made in various periodicals to a similar class of phenomenon which results in cattle and sheep in the production of an animal known to farmers by the curious name of "free martin." In this animal the internal organs are male, but as the accessory organs are female it passes for a creature of this sex until the suspicions of its owner are aroused by its absolute sterility, combined with a somewhat masculine appearance. It appears to be well established that in cattle free martins always come as twin to a normal bull calf. A cow may have twin bulls, both of which are normal and fertile, or twin heifers of which the same may be said, but if the twins are of apparently different sexes it is extremely likely, though not invariably the case, that the supposed female will be a free martin. According to a Swiss correspondent the unfruitful animal occurs in 70 per cent. of cases.

It is difficult to get any reliable information as to the probable

number of kids born with malformed genital organs, but this year among the total births of kids eligible for entry in the Herd Book it is believed that at least 2 per cent. belonged to the class under discussion—and the proportion is possibly much greater. One breeder of Toggenburgs expects to get “one or two bred every year”; another has bred two this year; a third has had “none at all lately, but at one time had several from Toggenburgs”; and so on.

In one respect goats differ totally from cattle, for malformed kids have recently come (*a*) singly, (*b*) as twin with a normal male, (*c*) as twin with a normal female, (*d*) as one of triplets the normal kids being male and female, (*e*) as one of triplets the normal kids being both males. Breeders are unanimous in asserting that in their experience two malformed kids have never been born at the same birth.

Although, as already remarked, goat breeders seem to call all kids with malformation of the genital organs hermaphrodites, there seems to be considerable variation in the precise peculiarity of each animal born. One breeder says that four have been born in the herd all different; another in reporting the recent birth of one describes it as “different to others.”

The following descriptions were recently received of malformed Toggenburg kids: “It was a very large well-formed kid—one of *three* at a birth—the other two being both males. . . . It had the appearance of being a male kid until it was closely examined, having no sign of the vulva of the female goat, but on the other hand there appeared to be no orifice of any kind on the under part of the body, and there was, as far as we could make out, no outlet for the urine at all. There was a peculiar formation of the scrotum, which had the appearance of raw flesh, having no outside skin or hairy growth like the other two kids had, and being moist to the touch, as if the urine might escape there, though we thought that was hardly possible. . . . I had another case of a hermaphrodite some time ago, and that was a *single* kid, and had the outward sign of being a female. She was *also* a very fine, large kid, having the sheath or orifice of the male, *as well as* the vulva of a female.”

A third kid from the same breeder was undoubtedly a male, but the orifice terminated between the teats instead of being carried forward, and no scrotum was observed.

What one breeder describes as the "distinctive organ" of the caprine free martin is the glans of the penis visible at the external orifice. According to details received this varies in size, and may be so small as to be practically unnoticeable, or of such a size as to be obvious throughout life. In one case the breeder had the very small rudiment removed from the kid, hoping in this way "to accentuate the female characteristics as they developed. But it was all to no avail. The goat grew enormously, though apparently a female she was a male in size, and in due course even developed, and very strongly, the characteristic smell of the male goat."

Free martin goats are said by one breeder of experience "invariably to have an appearance in head and size masculine, and the body (except for size) feminine in appearance." Very often the kid is effeminate looking in early life, and only develops a strongly masculine appearance as it nears the end of its second year.

The following particulars of living or recently bred free martins have been received from their owners:—

(1) Fawn and white hornless pedigree Toggenburg, born 1909, twin to a normal male, height 33 in. This goat, used as a chaise goat, is larger than a female but not so large as a large male, is more male than female in appearance, has the bearing and confidence of a male, is not timid, has no smell at any time like the male goat. At the beginning of the breeding season (October and November) worries the female goats with attentions like a male would. To the casual observer she is formed like a female, but there is a difference, she is fuller behind. She has two small teats.

The breeder says that this goat "strangely enough gradually developed (as far as one could see) the distinctive organ of the hermaphrodite as she grew up."

(2) The owner of (1) mentions coming across another of these goats, quite a fine female in appearance, no male characteristics at all, except a strong goatly smell. She never bred.

(3) Pedigree Swiss (Toggenburg type), bought as a kid as a female, but the animal grew to a great size, eventually "smelled worse than a male goat," and became so vicious, biting other animals, owner, &c., that it had to be destroyed.

(4) Reddish brown goat, marked with black dorsal band,

shoulder stripe and other shadings, and white. This goat, fully adult (fig. 1), is much bigger and more masculine in appearance than a female, and has always been used by children as a chaise goat. Nothing is known about it by its present owner beyond the fact that it is a pedigree goat. It has no goaty smell and never evinces any desire to breed. It dribbles its urine. It has a very masculine head and beard and a feminine body. It has two small teats. In character it is bold but gentle; much given to rearing up and butting like a male. It passes for a female with everyone, and is superficially formed like one.

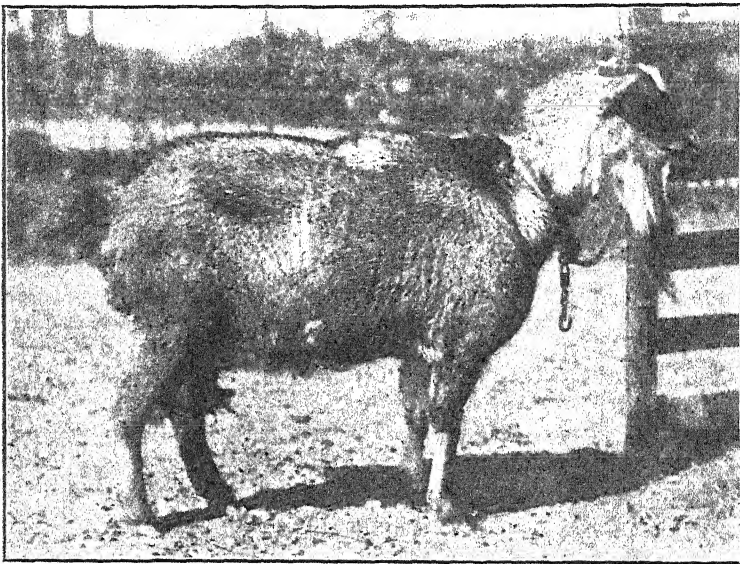


FIG. 1.—A "Free Martin" Goat (No. 4 in the text).

(5) Pedigree Toggenburg, born as twin to a normal female. This is the animal already alluded to as having been operated on.

(6) Pedigree Toggenburg, with no outward appearance of being abnormal, except *very* small teats and a masculine build. This goat has never come in season or shown any inclination to breed. She has no goaty smell. She won first prizes as a she-kid and she-goatling. The owner says that goats of this class are not unusual and that they sometimes win prizes as very fine she-kids.

In addition to these particulars, obtained from various

sources, the writer was fortunate enough to be able to procure from a breeder what was described as a typical hermaphrodite goat. The animal was a black and white, hornless, short-haired Anglo-Swiss kid, born March 29, 1912, and eligible for entry in the Herd Book (fig. 2). It was bred as the result of mating a son with his mother when he was about 6 months old. Three kids were born, one male, one female (born dead), and this so-called hermaphrodite.

The kid was kept under close observation from a fortnight old and reared to the age of nearly five months.

The kid passed for a female, but was not formed precisely

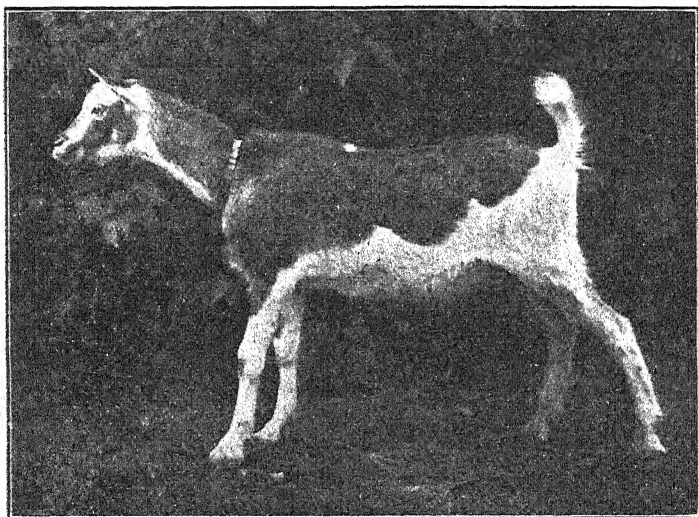


FIG. 2.—An Anglo-Swiss Kid ("Free Martin" No. 6 in the text).

like one, for the external orifice was lower down than in a normal female, and there was a glans penis visible.

The teats were rudimentary, there was no pendulous scrotum, but there were projections in the groins, which first began to be visible towards the end of May, when the animal was nearing two months old, and rapidly swelled till they became of noticeable dimensions (fig. 3).

Partly because the kid assumed the male position—stretched out with concave back—and partly because of the interference of the glans at the orifice, the urine soiled the legs and stained the coat. Sometimes it was passed forward between the legs,

at other times it was sprinkled, and it was almost always discharged jerkily.

At from four to five months old a slight smell was occasionally noticeable, suggesting that the kid would eventually develop the characteristic odour of the male goat.

The kid developed a beard.

In shape of head and body the animal was thoroughly effeminate, but it had some of the dirty habits peculiar to the male goat, and exhibited a number of masculine traits, such as manner of charging, &c. In character it had all the boldness and confidence of a male, and there was an entire absence of anything like feminine timidity.



FIG. 3.—View of Hind Quarters of Anglo-Swiss Kid (same as fig. 2).

The kid was killed on August 20, 1912, and was by the kindness of the authorities in charge of the Museum of the Royal College of Surgeons submitted to a careful dissection and examination.

Dr. A. Keith describes the kid as “what is usually called a hermaphrodite—or rather, an imperfect male—exactly similar to the free martin of cattle.”

The report of the dissection is as follows (see fig. 4):—

“The large glands which lie in the imperfect scrotum are testicles, and yet the genital epithelium which lines the tubules of

the testicle does not show any trace of forming spermatozoa. The lining cells are columnar and evidently represent the supporting cells only, the real genital or sperm-forming cells being quite absent. I expected to see between the seminal tubules abundance of those cells called interstitial—they seem to be the ones which actually influence the development of certain secondary sexual

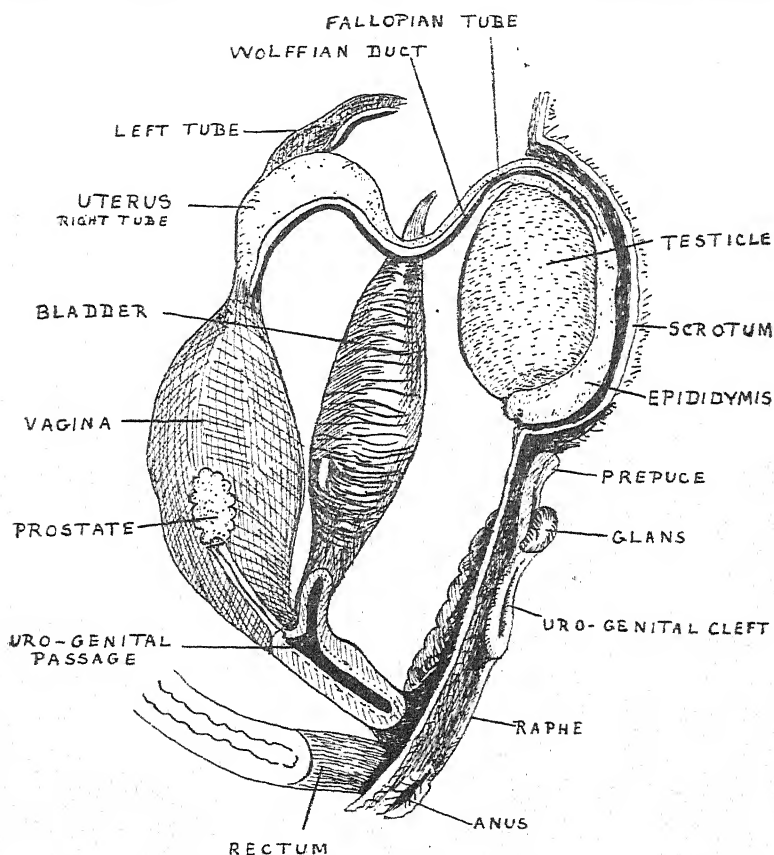


FIG. 4.—Dissection of Generative Organs of Goat shown in figs. 2 and 3.

characters—but in your goat these interstitial cells are present, but there are very few of them. Leading away from each of the large testes are two ducts: (1) The ordinary sperm duct (Wolffian duct), small, ill-developed, which when traced down loses itself in the wall of the vagina; (2) the oviduct or Fallopian tube, which leads to a uterus of moderate size; the two uteri end in a capacious vagina, which, however, has a very small

opening into the uro-genital passage. On each side of the vagina is a small gland, about the size of an almond, which I take to represent the prostate, because it has the microscopic structure of that gland. It may be Cowper's gland; its duct opens into the uro-genital passage at the side of the orifice of the vagina. In any case, it is a secondary sexual organ of the male.

"The bladder is normal. The uro-genital passage, leading from bladder and vagina, is formed as in the male, until it reaches the exterior in the perineum, where it ends in a cleft, the uro-genital cleft, which is surrounded by free folds. The formation of the penis and urethra in the penis is arrested. The glans of the penis is present; it is unperforated by the urethra as in the female; the prepuce is not folded round the glans. The condition of the penis and urethra thus recalls the condition in the female, except that the urethra is more prolonged into the perineum than in the female, and the glans is much larger. We also examined microscopical sections of the suprarenal bodies and thyroid, but found no disturbance in their structure.

"The condition is that of an imperfect male—sometimes called hermaphrodite. It is exactly similar to the condition described by John Hunter in free martins among cattle, the free martin, being always a twin to a female calf."

A DISEASE OF MULES SIMULATING GLANDERS.*

By D. P. LAURENCE EDWARDS, M.R.C.V.S.,

Suva, Fiji.

With Bacteriological Report

By ARCHIBALD IRELAND, M.R.C.S., L.R.C.P., D.P.H. OXON.

Medical Officer of Health, Suva, Fiji.

ON August 18, I was called in to attend five mules at Naselai. I found them all suffering from a lymphangitis of one or more legs. There was also cording of the lymphatics. These abscesses appeared cold and painless; they were nodular and freely movable under the skin and hard, very much resembling small subcutaneous fibromata. A very small percentage of them

* We shall be glad if you will kindly publish our report in your Journal, as we are unaware of any published description of the disease. We note on page 600 of Oster-tag's "Meat Inspection," third edition, 1907, that a pseudo-glanders bacillus staining by Gram's method was isolated by him from horses. It is to be noticed, however, that the disease investigated by us was confined to mules, although there were horses in the same stables, and that the Schneiderean mucosa was affected in all cases, whereas the cases from which Nocard isolated his organism presented only skin lesions.—A. I. and D. L. E.

had burst, and were discharging a small amount of thickish white pus (consistency of cream). Some of these abscesses showed signs of healing. The size varied from the size of a pea to that of a hen's egg. They were situated on the inside of the thighs and hocks.

Two of these mules had a profuse blood-stained tenacious discharge from both nostrils, and ulcers the size of two-shilling pieces were found both on the septum and other parts of the nasal mucous membrane. There was not any adenitis of the submaxillary glands. The temperature was slightly raised, being between 102° and 103° F. All the mules were eating well and showed no signs of depression. The lymphangitis was not very pronounced, moderately painful, and the mules were fairly lame. Swellings were also present on the abdominal walls.

As it was thought that this might be an outbreak of glanders these mules were malleined (Cutter Laboratory Mallein, Berkeley, U.S.A.), but did not react. There was only one local swelling 3 in. by 2 in. at its maximum. This was painless, and disappeared in thirty hours. None of the mules showed any systemic disturbance.

Smears of pus from an unbroken abscess were then examined for the "cryptococcus of Rivolta," but it was not present.

These mules were then isolated at one end of the stable, the best that could be done as there was then only one stable on the estate, but an isolation stable has since been built.

On August 20, two mules were suffering from laryngitis, and on August 24 tracheotomy was performed on three mules, one more having developed laryngitis in the interval.

On September 4 a mule died, and a *post-mortem* examination was made. Gangrenous pneumonia affecting both lungs was found, but no nodules. There was also extensive ulceration of the mucous membrane of the nose and bones, and the septum nasi was ulcerated through, the hole being 1½ in. by 1 in. There was extensive ulceration of the larynx. The facial sinuses were healthy, and there was no ulceration of the trachea. The lymphangitis was associated with the usual straw-coloured exudate; the subcutaneous abscesses had very thick walls ½ to 1 in. thick, and contained a small suppurating centre, the pus being thick.

I have been able to make six other *post-mortem* examinations, and in these mules I have found the same lesions with the excep-

tion of gangrenous pneumonia. In five cases small abscesses were found in the lung, also abscesses in the pharyngeal and mesenteric glands.

Thirteen mules have died, and six are now affected. No mule that has once shown symptoms of the disease has made a permanent recovery. Four mules have made apparent recovery, but all have had a relapse, and three are already dead.

Case 1.—Chestnut female mule showed in October lymphangitis and abscess on near fore leg, recovered and remained apparently healthy three months.

Case 2.—Brown mule gelding, lymphangitis of hind leg. Abscess on scrotum remained apparently healthy two months.

Cases 3 and 4.—These mules only remained apparently healthy for two weeks.

The estate was absolutely free from disease for a fortnight in October last; at the end of that period it again broke out. The longest period that the stud has remained free after isolation of all affected animals in a separate stable is three weeks, but I do not pay much attention to this, as where Indian labour is employed on a small estate absolutely strict isolation is practically impossible.

A vaccine was prepared, and on November 19 all mules on the estate received a subcutaneous injection of 360 million bacteria, and the sick two further doses of 260 million at intervals of five days. On February 19 all the mules received a further injection of 720 million. Since the preparation of the vaccine, all the diseased mules have received three doses of vaccine at intervals of five days whenever possible.

Since the introduction of the vaccine, the course has become far less acute. At the beginning death occurred in twenty-one to twenty-eight days, now death never occurs in less than seven weeks; often longer. Whether this is due to the vaccine or not I am not prepared to say, but I regret that I was not able to use the vaccine more regularly in all cases. The lesions in the nose do not progress half so rapidly, and the nasal ulcers are smaller in size, being of the size of 1s., and a few the size of 6d. The first symptoms are usually those described in the five mules. The next that is seen is laryngitis. This occurs after a variable period of about three days to three or five weeks. Swollen lymphatics and subcutaneous abscesses make their appearance all over the body. These abscesses show no great tendency to

burst, only about 15 per cent. breaking naturally. They discharge for a few days, and heal up in about ten days. This is very short time for healing in this country, where wounds take 100 per cent. longer to heal than in Great Britain. Many of these abscesses become reabsorbed without breaking. If lanced, they will often heal up before all the pus has been evacuated, and a secondary abscess sometimes forms.

The septum is usually perforated by the ulcers in ten to thirty days. I do not think that these large ulcers are formed by the anastomosis of smaller ones. The submaxillary glands when swollen usually show three or four large nodules, and it is never firmly attached to the ramus of the jaw, being freely movable, and in about 20 per cent. of cases it suppurates. This lesion is not always present when there are lesions in the nose, but it is present fairly often—about 50 per cent. The size of the gland also bears no relation to the extent of the lesions in the nose, very often the submaxillary swelling is on the opposite side of the nasal ulcers, and though towards the end the nasal lesions are bilateral, the submaxillary swelling remains very often unilateral.

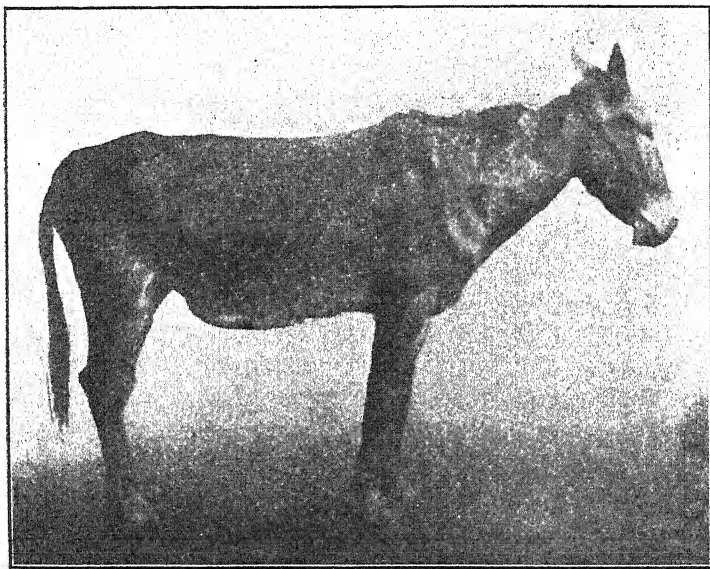
The final stage is pneumonia, shortly followed by death.

I find that this disease is also present in the Nadi district. In February, 1911, I was called in to investigate an alleged outbreak of glanders on "Mugunyah" plantation there. On my arrival, I found that there had been two suspicious cases, one mule having died before my arrival; the second mule was alive, and after a careful examination I came to the conclusion that it was perfectly healthy. On my questioning the stockman, he told me the symptoms shown by the dead mule, and I am convinced that the mule died from this disease. Another outbreak was reported on this estate in October last; two mules were malleined by the stockman. One was said to have reacted. On my arrival, I found that the mule that was said to be a reaction was the mule that had been regarded by them as suspicious in February. He had, however, remained apparently healthy, and appeared quite healthy when I saw him. I found that the reaction was based on local swelling, but that the mallein had been injected at the lower edge of the mane, just in front of the withers, and naturally a swelling had occurred. This lasted two or three days only. The mule is still healthy and at work. The second case said not to have reacted was a 4-year-old mule, who was a perfectly typical case of this disease. This mule died three weeks

after I saw it. Since then there has not been another case on this plantation.

I find that these two mules at Nadi and the mules that first showed signs of disease at Naselai, arrived in Fiji from U.S.A. in S.S. "Waitemata," August, 1910, and before being shipped were malleined by a M.R.C.V.S. at San Francisco.

A photograph of a typical case is enclosed.



CASE OF MULE SUFFERING FROM THIS DISEASE.

Note swollen lymphatics and abscesses on neck, side flank, and belly. Note cedema on abdominal wall and lymphangitis of legs. This animal also had ulceration of septum nasi. This is one of the animals from which the bacillus was isolated.

I beg, in conclusion, to point out in my opinion the main differences between this disease and glanders:—

(a) Abscesses do not tend to burst, and having burst, quickly heal.

(b) The large amount of fibrous tissue wall and small suppurating centre.

(c) Large size of nasal ulcers and rapid rate at which ulceration proceeds.

(d) The large number of cases in which the submaxillary gland suppurates.

(e) Absence of nodules in lungs.

Since writing the above report I have to say that my recom-

mendations were carried out; the remaining six mules were destroyed, and the buildings disinfected.

There has been no further recurrence of the disease. *Post-mortem* examinations of these six mules were made, but no further light was thrown on the pathology of the disease.

REPORT OF THE BACTERIOLOGY OF A DISEASE AFFECTING MULES IN
THE REWA DISTRICT, BY ARCHIBALD IRELAND, M.R.C.S.,
L.R.C.P., D.P.H. Oxon.

On November 3, 1911, at the request of the veterinary surgeon, I visited the estate of Naselai, near Nausori, in company with him.

Some of the mules on this estate were suffering from a disease simulating in some of its clinical features glanders. The most striking and constant lesions were ulceration of the nasal mucous membrane and superficial abscesses about the neck and upper parts of the legs.

Cultures.—I inoculated the following tubes:—

- (a) Glycerine potato, from nasal mucous membrane.
- (b) Glycerine potato, from small abscess in the neck.
- (c) Agar-agar slope, from small abscess in the neck.

All from the same animal, which presented well-marked lesions.

They were incubated at 37° C., as were all cultures used in this investigation.

Tube A in forty-eight hours presented a luxuriant mixed growth. The surface of the potato was covered with a creamy custard-like growth, very profuse, and spreading on to the sides of the tube. There were also a few discrete round white colonies, one large orange yellow colony, and one large brown one. The white colonies gave a Gram-positive staphylococcus, as also did the orange yellow one. The brown colony proved to be a long narrow club-shaped bacillus, showing marked unipolar staining with methylene blue; it was, in fact, a chromogenic organism. The organism producing the main custard-like growth was a small bacillus with rounded ends, staining somewhat faintly with methylene blue, and Gram-positive, though not deeply stained by this method.

Tube B in forty-eight hours showed a small discrete golden yellow growth. Slides from this culture showed a small bacillus with rounded ends, staining faintly with methylene blue, and not

decolourized by Gram's method, though not deeply stained. This bacillus was in pure culture in this tube.

Tube C in forty-eight hours gave a number of small discrete whitish colonies, the organism comprising which, and which was in pure culture, was a small bacillus with the same porphology and staining reactions as the bacillus described above as occurring in the custard-like growth of tube *A*, and in the pure culture of tube *B*.

Thus a bacillus was obtained from the lesions, in pure culture in tubes *B* and *C*, and from the custard-like growth of tube *A*, having the same morphology and staining reactions.

Subcultures.—A series of subcultures was made from the custard-like growth of tube *A*, and from tubes *B* and *C*, inoculating them from potato to agar, and from agar to potato alternately, and a pure strain of a bacillus thus obtained in each instance.

The bacillus thus isolated was identical in size, morphology, staining reactions, and cultural characteristics in all three series.

Description.—It is a small slender bacillus, with rounded ends, showing beading of the protoplasm. It was of uniform size in all the cultures, being in length 2 to 3 μ (about the size of *B. typhosus* in young culture). No involution forms were seen. It stained somewhat faintly with methylene blue, and was not decolourized by Gram's method, though staining but faintly.

Cultural Characteristics.—Glycerine-potato, in twenty-four hours, a small creamy growth, slightly yellow, more abundant in forty-eight hours, and becoming a darker brownish yellow in seventy-two hours, and gradually turning to a chocolate colour in three weeks.

On agar slope, in twenty-four hours, a semi-transparent whitish growth, not luxuriant, and with little tendency to spread; it became more opaque as it grew thicker, but no further change occurred in it.

Glucose-litmus agar (stab), in twenty-four hours showed no growth, but in three days a little whitish growth showed in the upper part of the needle track, with slight acid production, but no gas.

Vaccine.—On November 8, a vaccine was prepared from culture tube *C* after it had been re-examined and found uncontaminated; an emulsion was made, 10 c.c. of which contained 360 million bacilli, using normal salt solution with 0.25 per cent.

lysol. The emulsion was then placed in the hot-water oven at 60° C for one hour.

On November 9, the mule from which the cultures were made was injected with 10 c.c. = 360 million bacilli, and on November 14, a further dose of 720 million bacilli were given to the same animal.

The mule showed some improvement after the first injection, the abscesses resolved, and the pus formation ceased. It had, however, developed a septic pneumonia, of which it died on November 20. *Post-mortem*—no pus was found in the swellings about the neck and legs.

On November 17, nineteen further mules were injected with the same vaccine, giving 360 million bacilli to each. Of these, five were affected with the disease. On November 21, one more animal received a dose of 360 million.

The veterinary surgeon reported November 21 that after the injection of the vaccine:—

(1) The pus in the abscesses showed a marked tendency to dry up, and that local swellings disappeared.

(2) The ulceration of the mucous membrane was retarded.

(3) The laryngitis remained unaltered.

Inoculation of Animals.—The following experiments were carried out:—

On November 15, two guinea-pigs X and Y were inoculated with emulsion from tube R (agar), subculture 3rd from tube B.

X, a female, intraperitoneally.

Y, a male, by scarification (right hind leg).

X was unaffected, and is now alive and well.

Y died on the eighth day.

Post-mortem.—This guinea-pig Y showed the following lesions: The seat of scarification was normal and there was no enlarged glands. The liver, spleen, and kidneys were normal. There was pneumonia of the left lung, and the suprarenals were both red and engorged, especially the left. Both testicles were found in the abdomen, and were slightly enlarged, and both epididymi were dark red and engorged.

The following cultures were made, using agar-agar slopes, from:—(a) Heart blood, (b) Left lung, (c) Suprarenal, (d) Testicle.

Each of these four tubes gave a growth identical with the growth on agar of the original bacillus isolated from the mule,

and subcultures on potato and glucoselitus agar grew in a precisely similar manner to the growth on these media of the original organism.

The four cultures (a), (b), (c), and (d) were pure, and showed a bacillus having the size, morphology, and staining reactions of that organism, as did also all the subcultures.

It gives the indole reaction in a seven days' broth culture. It does not stain with osmic acid or with Sudan III.

On November 24, a further guinea-pig was inoculated subcutaneously with an emulsion from subculture V (agar 3rd from B). This guinea-pig Z lived for seventy-five days, and then died. No obvious lesions were present, and the cause of death was not apparent.

On November 12, a horse was inoculated with an emulsion from an agar subculture, second from (d) guinea-pig. This horse died on the eleventh day. *Post-mortem*—there was found to be much swelling about the site of the injection, which was subcutaneous, and there were small abscesses in the subcutaneous tissue in this situation (the near fore leg), and there were also small abscesses in the lungs and liver. Early peritonitis with some ascites was also present.

Unfortunately I was unable to obtain cultures from this animal.

The conclusions to be drawn from these investigations are:—

That the bacillus isolated, and which it is reasonable to suppose is the cause of the disease, although resembling *B. mallei* in some respects, is certainly not identical with it. The differences shown are in:—

(a) *Morphology*.—The bacillus isolated is smaller than *B. mallei*.

(b) *Cultural Characteristics*.—The growth on potato was very considerably different to that of *B. mallei*; the growth was much more rapid, giving a creamy growth in twenty-four hours, whereas *B. mallei* is seldom distinguishable in culture till the third day, and is then seen as clear yellow drops like honey, and this is commonly regarded as characteristic of *B. mallei* and peculiar to it.

The growth on agar never became brown as does that of *B. mallei*.

(c) *Staining Reactions*.—The bacillus isolated was cons s-

tently Gram-positive, whereas *B. mallei* is easily decolourized by this method.

With regard to the inoculation experiments:—

It is greatly to be regretted that a mule could not be obtained for this purpose, as the disease has so far been confined to those animals, and horses, although exposed to infection, and using the same stables, have escaped infection with the disease.

The recovery of the organism from the testicle of guinea-pig Y, and the fact that they were affected, as were the epididymi, perhaps points to an organism allied to *B. mallei*. The death of the animal on the eighth day, however, and the death of the horse on the eleventh day, do not correspond with the usual results of inoculation with *B. mallei*.

Finally, I think from a consideration of the above data, we may conclude that although the bacillus isolated is not *B. mallei*, it may be regarded as belonging to a closely allied group.

Clinical Articles.

URINARY CALCULI IN A COB.

By G. MAYALL, M.R.C.V.S.

Bolton.

BAY cob, 4 years old, brought to me with the history that he could not make his water properly. Examination failed to reveal anything abnormal about the penis or urethra. Gave six powders pot. nit. and pot. bicarb., and told the owner to let me see him in a few days. On November 5 he was brought to me, and I had him under observation for an hour. Found him shortly after coming in attempting to urinate, but urine was only passed in dribblets and with evident pain. Tried to pass the catheter, but found an obstruction about 2 in. from the urethral opening. On manipulation I could feel some little hard bodies in the urethra. I injected some olive oil up the urethra with a small syringe, and then gradually worked the hard bodies down, which proved to be three small stones. The urine flowed away in a good stream after this, and the cob has worked well and remained quite free from the trouble since.

A CASE OF "INTUSSUSCEPTION."

BY CAPTAIN A. F. DEACON, A.V.C.

Remount Dept., Lusk.

ON November 21, a horse was brought in from grass at 8 a.m., trembling and sweating freely and in great pain, evinced by getting down as low as possible, with his fore-legs stretched out and his head between them, resting his forehead on the ground. When standing he seemed unable to raise his head.

Treatment.—Fæces taken from rectum, which was very full, and enemas given. This gave great relief. Temperature, 104.6; respiration, 26; pulse, 58 when first taken in.

At 4 p.m. on the same day he had another attack, the same treatment giving relief. Temperature 103; respiration 24; pulse 50.

At 10 p.m. he was again treated, though the bad symptoms have not again appeared. He passed a fair night.

November 22, 1912.—At 6.30 a.m. treatment again continued. Temperature 103.2; respiration 24; pulse 52.

At 3.30 he had another bad turn, treatment once more relieving him. Temperature 104.2; respiration 26; pulse 52. Treatment repeated at 10 p.m.

November 23, 1912.—At 6.30 a.m. treatment continued, but not during the day, as no bad turns occurred and he was straining a great deal. Temperature 102.4; respiration 20; pulse 52.

At 5.30 p.m., in attempting to take away the fæces, it was found that there was a great deal of resistance owing to the gut being forced back, and when the hand was taken out a portion of the bowel was everted; this was put back and treatment discontinued. From this onwards he made an uninterrupted recovery during the night, passing dung, and eating a little, which he had not done previously during illness.

SUCCESSFUL TREATMENT OF TETANUS WITH
LIQUOR FERRI PERCHLOR. FORT. B.P.

By J. F. D. TUTT.

Class C Student, Royal Veterinary College, London.

THE great successes that have accompanied the employment of this preparation in the treatment of tetanus may, I think, be of especial interest to readers of this Journal.

The iron was given in the form of rectal injections three times a day, each of the injections having the following composition:—

Liquor ferri perchlor. fort.	...	...	5i.
H ₂ O (equal to body temp.)	...	...	q.s. Oi.

This was done in ten successive cases during 1911-12 and no death occurred, complete recovery taking place in two to three weeks' time, no other treatment besides this being employed. I have not seen one death when this treatment has been adopted, excepting, of course, in those cases when the horse was only seen when *in extremis*.

If any member of the profession has employed this mode of treatment, I would be very much obliged if he would record his results in this Journal.

UNUSUAL BODY IN THE THROAT OF A HEIFER.

By J. F. D. TUTT.

Class C Student, Royal Veterinary College, London.

Subject.—Shorthorn heifer.

History.—The owner had noticed that the animal was losing flesh and that her breath was very *offensive*.

On opening the mouth, a body was seen at the back of the throat, and on being withdrawn was found to be a jawbone of a sheep.

However the animal managed to get this into her throat is quite a mystery to me, and I do not remember seeing any similar case recorded. It had evidently been in this position for five or six weeks—this being the time put down by the owner since the animal began to lose health. The animal rapidly put on flesh, and was sold shortly afterwards at the local market.

A CONGENITAL DEFORMITY IN A HEIFER.

By A. ERNEST WILLETT, M.R.C.V.S.

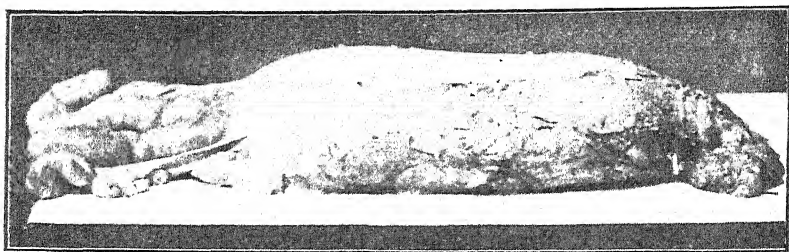
Staines.

THE case was that of an 18-months-old Shorthorn heifer, in fat condition, which was supposed to have eaten a lot of elm bark.

She was very restless, with dilated pupils, occasionally bound-

ing from side to side of the stall, grunting slightly, pulse quicker than normal, but with no temperature.

An aperient was given, and I saw her again the next day. She was then straining considerably, and rectal examination revealed what appeared to me at the time to be a distended bladder.



Congenital Deformity of the Vagina.

I proceeded to pass the catheter, but no urine followed, and a further examination revealed the condition shown in the photograph, as she was fat and in good condition before slaughter.

Post-mortem examination revealed the vagina to be practically a closed sac with fluid contents, much larger in dimensions than the whole of the uterus.

As no case of this kind has ever before come to my notice, I thought it sufficiently interesting to be worth placing on record as a guide to others who may meet with a similar condition.

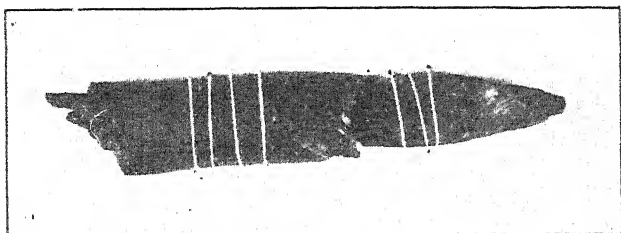
FOREIGN BODY IN THE HOOF AS THE RESULT OF AN ACCIDENT.

By FREDERICK HOBDAV, F.R.C.V.S.

Kensington, W.

THE figure here shown depicts two pieces of wood, reunited for the purpose of the photograph, which were taken from the hoof of a valuable hunter. The accident happened when galloping down a ride in a wood, the horse turning a complete somersault and getting up very lame, and only being got home with great difficulty. When the groom was washing the foot he found that a piece of wood had buried itself in the horn, and the top portion was withdrawn, the horse being sent to exercise in about three weeks. The wound, however, never healed completely,

and continuously discharged a little sero-sanguineous fluid. An exploratory incision was made through the wall of the hoof just below the direction of a probe which could be passed in from the top of the coronet. As a result, and after some considerable manipulation, the pointed end of the stick was seized and withdrawn.



Piece of Wood removed from Horse's Hoof (actual size).

The wound was treated antiseptically and soon healed.

The chief points of interest are the length of time it had been present without severe purulent infection, and the slight amount of lameness, when one considers the size of the piece of stick and the position in the horny hoof.

RESULTS OF AUTOPSIES ON 125 HORSES THAT DIED OF COLIC IN BERNE.

BY DR. A. REINHARDT.

Girusheim-a Rh.

FROM *post-mortems* on 125 horses dying of colic in Berne, Reinhardt established the following causes of death:—

In 18 cases, gastro-enteritis; 7 cases, overloading of stomach; 1 case, stoppage of ileum; 1 case, stoppage of rectum; 3 cases, stoppage of intestine through fæcal excretions; 1 case, stoppage of the colon through cicatrices; 15 cases, ruptures of the stomach; 2 cases, ruptures of the ileum; 7 cases, ruptures of the colon; 1 case, rupture of the rectum; 2 cases, volvulus of the duodenum; 11 cases, volvulus of the whole small intestine; 9 cases, volvulus of the ileum; 24 cases, volvulus of the colon; 2 cases, volvulus of the small colon; 2 cases, volvulus of the small intestine and colon; 4 cases, invagination of the small intestine; 10 cases, incarceration of intestinal segments.

A comparison of the findings at Berne with those in Berlin

are instructive. Of 428 cases in Berlin 15.18 per cent. of fatalities were due to stoppage of the colon and cæcum, whilst such cases in Berne were not seen. In large towns and in neighbourhoods where dry feeding exclusively prevails stoppage of the intestine is a much more frequent cause of death than in neighbourhoods in which dry feeding is alternated with green food.—*Deutsche tierarst. Woch.*

Canine Clinicals.

GASTROTOMY IN A BITCH.

By G. MAYALL, M.R.C.V.S.

Bolton.

THE patient was an Airedale terrier bitch, which had been gradually going thinner for some months. On examination when standing and putting on the back an elongated body not unlike a sausage-skin filled with pebbles could be found and manipulated in the stomach region and small bowel. The bitch was kept without food for twelve hours, a hypodermic injection of $\frac{1}{2}$ gr. of morphia was given, and half an hour afterwards she was put on the operating-table and chloroformed. Laparotomy was then performed, and the sausage-shaped body felt for; it was found to be the stomach and about four inches of bowel leading from it. The stomach was opened, and a wonderful sight came to view, consisting of about 160 particles of different hard and soft substances. A round piece of wool, a piece of india-rubber, cotton-thread, small bones (very numerous), and two or three little stones, being among the foreign bodies found. A large opening had to be made to clear out the contents of the stomach and bowel, and the organs were repeatedly washed in warm chinosol solution to cleanse them and afterwards sutured in the usual manner. The abdominal wall (skin, muscle, and peritoneum) was sutured, and the wound covered with iodoform collodion. I did not expect the bitch to live, and she died in the night, after coming round well from the anæsthetic.

It was remarkable that she should have carried all these foreign bodies in her without any acute signs of pain and with nothing but gradually increasing loss of flesh. Her owner stated that up to the time she was 18 months old she always played about and probably swallowed any foreign articles she came

across. He considered that the things mentioned had been inside her for eighteen months at least, she being 3 years old when I operated.

CONGENITAL GOITRE IN THE DOG.

By ANTON LOKEN.

Konigsberg.

ACCORDING to Professor Kitt goitre is most frequent in dogs, sheep, and goats, now and then in horses, but seldom in cattle and cats. In this district of Königsberg most cases of this disease occur in calves and horses. In the first case the goitre is always congenital, and disappears, as a rule, in the first years of life. In the adult animal the gland is difficult to feel, or quite unfeeling. In foals congenital goitre is now and then encountered, but in old horses changes in the gland, due to hypertrophy, cysts, adenoma, and pure carcinoma, are mostly to be found. In swine and sheep cases of goitre are now and then noticed, but until recently I never saw one in the dog.

The patient was a cross-product of an elk dog and a Greenland bitch. It was brought from Greenland by a miner. It was an extraordinarily fat bitch, with a small plump head, remarkably short bones, and a great collar-like wen. This was doubled-sided, and each gland was as large as a hen's egg. The bitch was a lively little creature and sometimes ran round barking, but she soon lay flat on her side, and seemed trying to get her breath. A brother and two sisters out of the same litter as this bitch also had the disease congenitally.

According to the owner the mother had a swelling on the neck, but not the father. Three months later I saw the bitch again; the growth had increased in size, and the glands on both sides were as large as a goose's egg. Heart-beats were 144 to 150; the veins of the neck over the swelling were greatly distended; the pulse-beat at the carotid was visible at a distance.

Pot. iodide was used, and the swelling declined, and afterwards the animal appeared to develop better. Nothing was known of the cause of the complaint. Examination of the water supply gave no result, but in another case of mine on a farm, where the calves, as well as the owner, his wife, and nine children, suffered from goitre, the water was found to be radio-active.—*Deutsche tierarst. Woch.*

Abstract and Report.

SUMMARY OF THE REPORT OF THE DEPARTMENTAL COMMITTEE ON THE PUBLIC VETERINARY SERVICES.

MINUTES APPOINTING THE COMMITTEE.

I.

I HEREBY appoint a Committee to inquire into the requirements of the public services with regard to the employment of officers possessing veterinary qualifications and to consider whether any further measures can with advantage be adopted for the selection and training of students with a view to such employment.

The Committee will be constituted as follows: Sir Alfred Hopkinson, K.C. (*Chairman*); Sir Thomas H. Elliott, K.C.B.; Sir Thomas W. Holderness, K.C.S.I.; Mr. H. J. Read, C.M.G.; Major G. F. MacMunn, D.S.O.

And I hereby appoint Sir Alfred Hopkinson to be Chairman of the Committee, and Mr. H. L. French, of the Board of Agriculture and Fisheries, to be its Secretary.

(Signed) WALTER RUNCIMAN,
President of the Board of Agriculture and Fisheries.
August 30, 1912.

II.

I hereby appoint Mr. Francis C. Drake to be a member of the Departmental Committee on the Public Veterinary Services appointed by my Minute of August 30, 1912, *vice* Sir T. W. Holderness, K.C.S.I., resigned.

(Signed) WALTER RUNCIMAN,
President of the Board of Agriculture and Fisheries.
October 25, 1912.

SUMMARY OF PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS.

(25) In the course of our inquiry we have arrived at the following conclusions:—

(a) That the requirements of the Army Veterinary Service are adequately met at the present time. (Section 4.)

(b) That the number of suitable candidates for appointments in the other public veterinary services is inadequate. (Sections 8-14.)

(c) That a largely increased number of veterinary officers possessing special qualifications will be required for the public services. (Section 11.)

(26) With a view to increase the number of highly qualified

veterinary surgeons available for employment in the public services, we recommend that:—

(a) Students possessing a suitable science degree should be granted exemption from one of the four years at present required for veterinary qualification, and that the requisite adjustment should be made in the course at the veterinary colleges. (Section 15.)

(b) Twelve scholarships should be offered each year of the annual value of £80, each tenable at a veterinary college for three years, with a view to encourage a number of men who have received a good scientific education to enter the veterinary profession. (Section 16.)

(c) Scholarships of an annual value of not less than £100 and not exceeding £150 should be offered each year to enable qualified veterinary surgeons to undertake advanced study and laboratory work at suitable institutions. (Section 19.)

(d) The method of notifying vacancies in the public veterinary services should be improved as above suggested. (Section 21.)

(e) Increased State aid should be given to institutions devoted to veterinary education. (Section 24.)

We believe that the adoption of these recommendations would lead to the more general recognition of the veterinary services concerned as constituting an essential part of the Government administration.

VICTORIA VETERINARY BENEVOLENT FUND.

THE quarterly meeting of the Council of the above Fund was held at 10, Red Lion Square, London, on Thursday, January 9, at 5 o'clock. Present were: Messrs. W. Freeman Barrett (President), in the chair; J. Dunstan, Hugh A. MacCormack, G. A. Banham, S. Slocock, F. Hobday, H. Sumner, W. Burt, and W. Shipley (Secretary).

The minutes of the last meeting, as published in the Veterinary Press, were adopted.

The Secretary then read the following report:—

Gentlemen,—It is my pleasure to present my quarterly report. As you are aware, owing to the alteration in the ending of our financial year passed at the meeting in Dublin, we have only nine months to deal with. I should also point out that as subscriptions are due on January 1 of each year, I have had only a few arrears of old subscriptions. The remainder of our income and expenditure has been from new subscribers and interest from invested funds, plus the accrued balance of last year.

Since the publication of our annual balance sheet we have received in interest and dividends £67 os. 4d.; in outstanding subscriptions, £5 13s. 6d.; in new subscribers, £59 5s.; in new donations, £64 12s.; and one life member, £10 10s. These two later sums must be invested, as by Rule 4, and are not available for present use.

We have increased the grants to our recipients in the cases of Mrs. Jones, Mrs. Gibson, and Mrs. Barford, to 10s. per week. We also increased the grant to a similar sum to Mr. Grinton, who, unfortunately, lived only a short time to enjoy it. Fresh grants of 10s. per week were made to Miss Horton, towards the education of her late brother's children; and 5s. per week to Mrs. Porter.

The grants to those entitled to Old Age Pensions have been reorganized, in order that they should receive the full benefit of these pensions. Through the liberality of friends at Christmas-tide each of these have, through the authority of the Finance Committee, had little necessities provided. I have been able to get friends who know of the condition of these poor old souls, all aged over 83, to administer a present of £2 each to them for absolute necessities. We are indebted to these gentlemen for their trouble and kindness in carrying out this work. I feel sure you will wish me to thank them.

I am unable to present the annual balance sheet audited, as time has not been available to get it through. It is not necessary to publish them before the annual meeting. I will have them ready at the next meeting. I, however, had a rough draft prepared. In this you will find our total income for the past nine months has been £135 10s. 6d. Our expenditure has been £205 3s. 1d., in monthly grants and expenses, leaving a deficiency of £69 12s. 7d., which has been met by our accumulated surplus on income account, thereby reducing that figure from £103 15s. 9d. to £34 3s. 2d. This is the only amount we have to carry on with until the new subscriptions come in.

I am aware that now we have got over the trouble of a nine months' financial year we should be able to make more satisfactory progress in our estimates.

I suggest to you seriously that we increase our present grants to all the widows in receipt of relief to a sum of 10s. per week. I feel sure you will agree with me that not one of them should have less, and that in cases where there are children dependent we should in the near future endeavour to make a grant of so much per child. At present, however, this must be only for consideration; our finances will not allow us as far as the children are concerned.

I may say that for the future year I estimate our expenditure at £350, made up of grants to our present recipients: nine at 10s. per week, £234; two fresh applications, both of whom I strongly recommend to you, £52; this is a sum of £286. Old Age Pensioners, £22 16s.; and incidental expenses, postages, &c., at £41 4s.

I estimate our income on the supposition that all our old subscribers continue; I have every reason to think they will, as I feel sure you have demonstrated to them the urgent necessity to support our Fund, and also, I think, that now the need is shown, many will seriously consider if they should not increase their present subscription. I anticipate, as the result of our work, a further increase in the subscribers.

If these happy conditions occur we should have an income of £345, made up of annual subscriptions, £248 16s.; interest and dividends, £96 7s. 6d.; plus increase of old subscriptions and new subscribers to meet deficiency.

I most urgently appeal to all members of the Council and subscribers to our Fund to do their utmost to bring the work we are doing before the members of the profession in order that we may induce them to help and increase our efficiency. May I, therefore, suggest to you that we increase the grants to Mrs. Barcham, Mrs. Muir, and Mrs. Porter to 10s. per week each. I have letters to confirm my opinion that these are deserving of our support.

I have applications for relief from Mrs. Rcd. Howard and Mrs. Irvin Roberts. I have letters and recommendations, which I produce for your consideration, and strongly recommend that a similar grant be made in each of these cases.

I have received letters of gratitude from all our old recipients. Thanks to the consideration of the Finance Committee our cheques were posted on December 23, instead of December 28, in order that the grant might be available for Christmas. I have made frequent inquiries in all old cases, and am assured that in each case our grant is urgently required.

I have received four votes for the London Orphanage Asylum. As we have no one available I suggest that if any member of the profession is interested he should apply to me at once, failing that I will return to the Secretary for distribution, with a request for favourable consideration if we have a case in the future.

I will read you correspondence from the Central Veterinary Medical Society in Ireland, and sincerely hope you will arrive at some definite conclusion to appoint the Advisory Committee selected. Perhaps in the near future we can have similar sub-committees in Scotland and Wales.

I think we should endeavour to increase the too slow but steady work we are doing. I am aware that there are many sad cases of distress that do not come to our notice, and it is only by the assistance of the Veterinary Press (to whom I am personally much indebted for valuable help) that we can bring to every member of the profession the urgency of our appeal. Unfortunately we are at present unable to let the wives and children of the members of the profession know of our existence; could we do so much suffering and distress could be relieved.

It is to be hoped members of the Fund will remit their subscriptions at their earliest opportunity. By doing this some bit of expense in the way of postages may be saved.

Let me take this opportunity to wish all prosperity to the members and to the Fund for the New Year.

It was resolved to confirm the action of the Finance Committee in making the Christmas grant to the Old Age Pensioners, and the Secretary was requested to write and thank the friends who had administered the money.

It was proposed by Mr. Sumner, and seconded by Mr.

Sloccock, that the grant to Mrs. Barcham be increased to 10s. per week.

In the cases of Mrs. Muir and Mrs. Porter the grants to be continued as before; further inquiries to be made.

In the case of fresh applications for relief, in one case it was considered desirable to obtain a doctor's report as to the inability to work, when, if satisfactory, a grant not exceeding 10s. per week be made. In a second case, as a grant of 5s. per week had already been made by the Benevolent and Defence Society, a grant of 5s. per week was, on the proposition of Mr. Sumner, and seconded by Mr. Sloccock, ordered, and further inquiries to be continued.

The Secretary was instructed to return the voting papers to the London Orphanage Asylum, and request that this action should be considered in case of an application by the Council for support in some future case on behalf of the Fund.

Correspondence was read from the Central Veterinary Medical Society of Ireland referring to the appointment of a sub-committee in Ireland, "for the consideration and recommendation of applications for relief and the furtherance of the objects of the Fund in Ireland."

The Council felt grateful for the help of, and consideration of, that Society, and were pleased to appoint on their recommendation: Messrs. J. A. Thompson (Lurgan), P. J. Howard (Ennis), J. F. Healey (Midleton), P. D. Reavey (Bundoran), and Professor O'Connor (Dublin).

The Secretary was instructed to send all necessary papers, and the particulars of these cases of relief at present in that country.

The Council view with great pleasure the increase of support received from Ireland, and hope eventually to have similar committees of recommendation appointed to further the cause of the Fund.

NEW SUBSCRIBERS: SEPTEMBER TO DECEMBER, 1912.

	£	s.	d.
H. W. Wilkinson, Dublin	0	10	6
Thos. Runciman, Ely	0	10	6
P. D. Reavy, Bundoran, Ireland	0	10	6
T. S. Atkinson, Douglas, I.O.M.	1	1	0
J. E. Johnston, Belfast	0	10	6
H. Morpew, Epsom	1	1	0
J. W. Coe, Stoke-on-Trent	0	10	6
W. Edmondson, Harrogate	0	10	6
L. C. Tipper, Moseley, Birmingham	0	10	6
H. Walpole, Whixeley, Yorks	0	10	6
J. B. A. Hare, Nava, Co. Meath	0	11	0
E. C. Winter, Limerick	0	10	6
North of Ireland Veterinary Medical Association	2	2	0
J. A. Thompson, Lurgan, Ireland	0	10	6
E. R. Edwards, Board of Agriculture	0	10	6

Donations.

	£	s.	d.
Anon., B. S., London	0	6	0
R. Ebbitt, Oldcastle, Ireland	0	10	0
Spreull, <i>re</i> Scottish C.V.M. Society	0	10	6
Anon.	0	10	6
Hugh Begg, Hamilton	0	10	6
A. Whicher, Bexhill-on-Sea	0	10	0
Geo. Grigson, Downham Market	1	1	0
E. A. West, London	2	2	0
H. W. Caton	2	2	0

One Life Member.

Wm. Jackson Young, Edinburgh	10	10	0
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Reviews.

Veterinary Toxicology. By G. D. Lander, D.Sc., F.I.C., Professor of Chemistry and Toxicology, Royal Veterinary College, London. Demy 8vo, pp. xii+312, with 39 figures in the text. Published by Baillière, Tindall and Cox. Price 7s. 6d. net.

This is one of the most welcome volumes that have been presented to the veterinary profession for a long time, and it fills a long-felt want. It is a very comprehensive volume, and is published at a remarkably low figure, when one considers the enormous amount of information it contains and the work it has entailed. A considerable portion of the matter is original, but probably its greatest value lies in the fact that it contains a faithful compilation of the records of innumerable cases of poisoning that have occurred in actual practice. Hitherto one has had to search, and search often in vain, for records that one knew must exist. Here we have lucid abstracts of them presented to us for ready assimilation, together with the references to the original papers when further detail is required. That the text is really well up to date is shown by the fact that Theiler's experiments on the toxic doses of arsenic and copper preparations just published are included.

The subject matter is treated under five sections. The first section consists of a dissertation on poisons generally, their varieties, modes of action, diagnosis, and treatment on general lines. The second section deals with "Mineral or Inorganic Poisons"; the third section with "Organic Poisons and Drugs"; the fourth section with "Poisonous Plants," grouped according to their natural orders; while the last section, which is entitled "Chemical Toxicology," deals with the general methods of separation of poisons from organic matter in the laboratory.

Each poison is dealt with systematically as to its toxic effects, symptoms, and treatment, and the very important medico-legal aspect of the case, and in many cases it is followed by a list of references to authors and articles on the particular poison.

We have very little exception to take to the subject matter, though we are not in accord with all the author's views. For example, he tells us that "subcutaneous or intravenous injection is a method of introduction of poisons rarely, if ever, likely to give rise to poisoning." In our view, with ever-increasing use of potent drugs by these methods, the likelihood of poisoning correspondingly increases, and especially so in the case of the smaller animals where such small doses are required. It is not such a rare thing to meet with cases of poisoning by strychnine and cocaine, for instance, where they have been used for their systemic and local effects respectively. Then, with reference to absorption from the skin, it is pointed out that substances in animal or vegetable fat are fairly easily absorbed, as for example, mercury, iodides, and alkaloids. Mercuric iodide might have been referred to as a notable exception in such a list. It is a dangerous poison administered internally, and in dogs 7 or 8 gr. are usually fatal. Wooldridge, however, frequently employs 60 gr. in one ounce of lard as an ointment well rubbed into the backs of dogs affected with paraplegia, and where licking is prevented he has never observed any systemic ill effects either of mercurialism or iodism.

The figures in the text are very good, and serve to impress one with the appearances of various poisonous plants.

"Printer's errors" are very few; one of them, however, refers to a "highly vascular pulmonary mucus."

Dr. Lander is to be congratulated on the sterling worth of his volume, and we unhesitatingly recommend its purchase by both practitioners and students.

The volume is produced in a very handy size, and is in the usual good style of Messrs. Baillière, Tindall and Cox.

Text-book of Meat Hygiene, with Special Consideration of Ante-mortem and Post-mortem Inspection of Food-producing Animals. By Richard Edelmann, Ph.D., Medical Counsellor; Royal State Veterinarian of Saxony; Professor in the Royal Veterinary High School, Dresden. Translated by Drs. Mohler and Eichhorn. Published by Messrs. J. and A. Churchill. Price 21s. net.

During recent years attention has been specially directed to food inspection, with the result that there has been an increasing demand on the part of veterinarians and others interested in this work for a comprehensive and at the same time concise text-book and practical guide on meat inspection. This demand has, we think, been met by the publication of the revised translation of Professor Edelmann's "Text-Book of Meat Hygiene." The illustrations and coloured plates are excellent, and the general arrangement of the work is good. A distinctive feature of the

book is the extensive tabulation of certain data and conclusions. The comparison of the eruption and replacement of teeth, the composition and utilization of various meat and food products, and a scheme for the disposal of the meat of tuberculous animals are especially worthy of note. The last-mentioned is of less value to English veterinarians and inspectors than the preceding on account of its American adaptation, but it serves as a very useful comparison of the English and American methods. Every branch of the subject of meat inspection is dealt with in a systematic, thorough, and at the same time concise manner, including the morphology and chemistry of the principal tissues and organs, the production, preparation, and conservation of meat, abnormal conditions and diseases of food-producing animals, *post-mortem* changes of meat, the examination of preserved meat, poultry, game, fish, &c., and meat poisoning, while a chapter is devoted to the consideration of abattoirs and stockyards. The question of fraudulent substitutions for meat is gone into as thoroughly as a work of this sort will permit, and some extremely useful comparisons are made. Three chapters are devoted to American methods of procedure in inspection and in the disposal of condemned meat, which, though differing from English methods in very many respects, are yet useful for purposes of comparison. It would have been well in a recent work of this kind had more space been allotted to the consideration of John's disease, which is barely mentioned. In the diagnosis of anthrax also we feel that the author would have done well to have mentioned McFadyean's colour reaction; since in the case of emergency slaughter when a microscopic examination is made of the spleen pulp besides the blood from peripheral veins as is suggested in the text, few or no anthrax bacilli may be found. It is always easy in a work of this sort to find points which are open to criticism, but they are, after all, only minor points, and we feel that the work fulfils all the requirements of a "convenient and authoritative guide to inspectors, as well as an admirable textbook and work of reference for students and veterinarians."

Veterinarians' Handbook of Materia Medica and Therapeutics.

By D. H. Udall, B.S.A., D.V.M., Professor of Veterinary Medicine and Hygiene, New York State Veterinary College. Size, 4½ by 6½ in. Pp. 177, flexible leather binding. Price \$1.75 net, post paid. Published by Carpentier and Company, Ithaca, N.Y.

In this handbook the author has attempted to put before the veterinary practitioner, in a condensed and simple form, much material relating to the uses and doses of the various drugs, the treatment of diseases, and the symptoms and antidotes of the commoner poisons. The arrangement of the book is simple and effective. The subjects dealt with are split up into eleven divisions; the two long ones, Nos. 4 and 5, relating to drugs and diseases respectively, are arranged alphabetically, so dispensing with a

detailed index. In division 4, under many of the drugs, numbered prescriptions are given containing the drug as an active agent. This arrangement greatly simplifies and shortens the written matter in the next division dealing with the treatment of diseases; the drug recommended is named, followed by the prescription number, so showing the manner and combination in which its action can best be obtained.

Tables of weights, measures, and solubility are included, also obstetrical tables, and tables of temperature, pulse, respiration, and dentition, followed by a small amount of hygiene in connection with the construction and disinfection of stables.

Division 10 covers eight and a half pages, and treats minutely with the routine which *should* be observed in making clinical diagnoses. The reading of this section alone should do good, if only to remind some of us of the necessity for attention to detail in order to make a correct diagnosis.

It is unnecessary to attempt a detailed criticism of the whole book, but some parts appear to merit more than passing attention. Some inconsistency is shown in taking, as the standard in the table of percentage solutions, water at 4° C., then in the following table of solubility calculating with water at 25° C.

It is inevitable that a book of this description contains much matter about which there is sure to be great difference of opinion. For example, in the doses given of some purgatives the author gives, quite unqualified, the dose of aloes barb. for a horse as 1 oz. up to half as much again; further, in the treatment of forage poisoning—intestinal intoxication—he advises the administration of 4 to 8 drachms of aloin, one or two pounds of sulphate of sodium daily; he follows this advice by saying that sometimes heroic doses of salts or aloes are required to purge animals in these cases. Many on this side of the Atlantic will not deny that these doses are somewhat heroic. Again, in intestinal impaction the “administration night and morning of a quart of oil (kind not mentioned), followed in a few hours by arecolin $\frac{1}{2}$ -1 gr. until impaction is relieved” does not appear particularly sound advice. It is well known that there is a great difference in the amount required of some purgatives in the south of England to that required in the north; doubtless the same variations exist in America, and a remark to that effect should have been made.

The suggestion to put on heel springs to spread the hoof in navicular disease is somewhat old and rusty, and will not gain much credence.

The section on stable construction might with benefit have been written at greater length—even at the expense of eliminating the three pages of the parturition table—and the construction of horse stables might then have been dealt with separately from that of cowsheds.

Writing on the subject of ventilation, the author describes where the air *exits* enter the stable, and recommends a single exit of 12 to 14 in. in diameter as suitable for a building containing ten to twelve large animals. We do not consider this to be sufficient, neither do we agree that enlarging the diameter of the

single exit was the ideal method of meeting any further demand due to a large increase in the number of animals. It would be far better to increase the number of exits, and place them at intervals along the whole length of the building.

The table of the dentition of the ox is not in accordance with the commonly accepted opinion in this country, neither is that of swine as complete as it might be.

The author states in his preface that the typographical and other errors have been materially reduced. Many still exist.

In spite of these criticisms, however, we are sure that this volume, so handy in size and so full of information, will be found of great service to both students and practitioners.

The printing, binding, and general finish of the book reflect credit on the publishers.

Personal.

PROFESSOR WOODRUFF has sailed for Australia to take up his duties as Director and Professor of Pathology at the Melbourne University Veterinary School. His departure was marked by a farewell dinner, given in his honour, and by the presentation of a handsome silver bowl inscribed with the good wishes of his many professional friends.

MR. J. W. T. MOORE, F.R.C.V.S., the Chief Veterinary Superintendent of the Woodside Lairage, Birkenhead, has recently been presented with a gold signet ring and a handsome silver rose bowl, as tokens of the good esteem in which his services have been held by the Liverpool Foreign Cattle Traders' Association.

Mr. Moore has held the position for many years, and has retired on account of age. It must be satisfactory to him to have these tokens of appreciation.

MR. BARNES, M.R.C.V.S., has resigned the position which he has held for some years, of Superintendent of Veterinary Inspector to the Metropolitan Cattle Market, Islington, and will shortly take up the position of Veterinary Inspector to the Municipal Abattoirs at Durban, Natal. Mr. Barnes has made himself very popular by his geniality towards the students of the Royal Veterinary College who were privileged to attend his demonstrations on Meat Inspection, and carries with him to South Africa many expressions of goodwill. His position in London will be filled by Mr. Hayhurst, M.R.C.V.S., formerly of Blackburn.

Translations.

INITIAL MESALLIANCE, TELEGONY OR IMPREGNATION.

M. JACOULET mentioned a work on this subject by Veterinary-Major Dr. Chornel at the sitting of "La Société Centrale de Médecine Vétérinaire," on April 4, 1912.

This work is of great interest to animal breeders. Since the time of Darwin the question has been known and discussed: Is it possible by mating to so influence a mother animal that subsequent offspring of another father inherit the peculiarities of the first sire?

This question, generally designated as infection of the mother, was denied by Settegast, Nathusius, Weissmann, Kent, Jansen, and others. It was considered that all progeny of this kind of a pure breed was the simple product of atavism.

Dr. Chornel in his recent work has recorded his own observations, which support the view of the impregnation or infection of the dam or female plant.

Lesbre and Pulliat give proofs that plants produced naturally or artificially may be influenced completely and continuously in the manner described.

Dr. Chornel cites the well-known case of a mare which was covered by a zebra stallion and produced striped foals in every case even to the third generation, although pure-bred stallions were used.

Further, the experiments by Cuénot in Nancy with yellow and white mice support this view. These results give irrefutable proof of the infection of the dam.

Dr. Debierre raised the not uninteresting question: Is it true that the first child of a woman so influences her that a child by a second husband inherits the peculiarities of the child of the first father?

A recent decision at Bordeaux supports the initial mésalliance view. A greyhound bitch was covered by a mongrel in a railway van. The owner sued the railway company, because the subsequent litter would be valueless and the bitch spoiled for future breeding. The law upheld the contention, and gave a verdict for the plaintiff on all counts.—*Schweizer Archiv für Tierheilkunde*.

COMPREHENSIVE SURVEY OF ZELLER'S CANCER TREATMENT.*

BY PROFESSOR DR. B. LEWIN.

ZELLER, who has been experimenting for seventeen years with a view to avoiding operative treatment in cancer, has succeeded in curing this malady, or limiting it, by means of silicic acid. In this way he has caused nine tumours to disappear. The silicic

* "Die Therapie der Gegenwart" (Present-day Therapy), No. 9, pp. 403-406.

acid is given three times daily, the dose being 0.18 gr. in the form of potassium and sodium silicate, or fifteen drops of liquor kal. silicate in a glass of water. Tumours greatly attacked by decay were, however, only checked in their growth, whilst necrosis and putrefaction advanced. In order to hinder the formation of the ptomaine, so injurious to the body, Zeller applied also an arsenic and mercury paste externally, made up as follows:—

Acid arsenic	...	...	...	...	...	5.0
Cinnabar (hydrarg. sulphurat. rubrum.) (Trans.)						15.0
Carbon vegetab.	...	...	...	...	...	1.0
Res. dracon	...	...	...	...	...	1.5
Fiat pasta, ad	...	...	...	...	...	100.0

Since November, 1910, fifty-seven cases have been treated by the internal and external therapy, and forty-four have been completely cured, whilst ten are still under treatment.

The following short directions are given by Zeller to those who wish to adopt his method. At first the cancerous tumour and its region are cleansed with benzene. Then the modified paste, called by Zeller "Zinnabarsana," is thickly plastered on the neoplasm and neighbourhood. When the paste is dry the little swellings are covered with collodion and the larger ones with adhesive plaster. This procedure is repeated each day for eight to fourteen days. At the same time $\frac{1}{2}$ grm. of the silicium salt (which he calls "Nacasilicum") is given three times daily as a powder. The powder is well borne, the appetite increases. Also, after the cure the silicate is given for a period of a year at least. The paste in small tumours causes little or no pain, but in large ones acute pain may last for a day. After the disappearance of the swelling a sore with a dirty yellowish surface remains behind. By cleansing with benzene and daily application of salicylic and zinc ointment healing occurs very quickly, and all that remains is a beautiful smooth cicatrix.—*Deutsche tierarst. Woch.*

A NEW BANDAGE IN SECTION AND RUPTURE OF THE FLEXOR TENDONS.

By BASS.

IN section of the flexors one is not always successful in restoring the normal gait and avoiding the horse becoming bare-footed by the use of plaster of Paris bandages and a gutta-percha splint. Bass had this defect in one subject on which he performed tenotomy. The horse suffered from dropping of the pedal bone on the opposite limb, and on this account supported itself badly on the operated limb. All bandages were useless until the following was applied: An iron splint was put on provided with an eye at the toe, and here a firm iron bar was affixed. It reached up to the fore-arm, and had a convexity in front of the fetlock. At the fore-arm there was a broad bow encircling a well-padded bamboo bandage which surrounded the fore-arm.

At the back side of the fetlock from the middle of the metacarpus to just above the foot a gutta-percha splint was put on. A linen bandage was put round the gutta-percha splint and iron support at the fetlock. Thus the fetlock was so strongly supported that it retained its normal position.

A similar bandage was employed with favourable results in paralysis of the radial nerve. Here a bamboo bandage reaching from the elbow to the fetlock was used after plentiful padding. By this means the knee was kept extended. The phalanges were kept rigid by an iron splint. This extended from an eye in the toe-piece to the metacarpal bone. It rested by a cross-bow against the bamboo bandage, and was bound to this. Finally a lace strap stretched from the bamboo bandage round the forearm to the hind ring of the slings. The horse could support itself on the paralyzed and rest the opposite one. The bamboo bandage is made of split bamboo canes. These are bound together with a strap in the form of a venetian blind. The bandage is applied to the limb after a solid padding with wadding. Although very light it is quite strong. In rupture of the flexors the bandage was only employed in order to avoid pressure from the iron splint over a large surface.

—*Deutsche tierärztl. Woch.*

Letters and Communications, &c.

Dr. Ireland; Mr. L. Edwards; Mr. J. A. Jordan; Professor Reynolds; Professor Antonini; Professor Liautard; Dr. A. Hughes; Mr. C. J. Davies; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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MATTHEW HEDLEY, F.R.C.V.S.

LATE CHIEF VETERINARY INSPECTOR TO THE DEPARTMENT
OF AGRICULTURE IN IRELAND.

THE VETERINARY JOURNAL

MARCH, 1913.

MATTHEW HEDLEY, F.R.C.V.S.

THE veterinary profession is much poorer for the loss of Matthew Hedley, Fellow of the Royal College of Veterinary Surgeons, who died on January 31, at Dublin, at the age of 60 years. Mr. Hedley belonged to a family of veterinary surgeons. He was born and brought up in Durham, and apprenticed to his uncle there, with whom he served a pupilage extending beyond the usual time. He had another uncle who practised in Kent. He studied at the Royal Veterinary College in London, from which he graduated with very great credit, having occupied a high place in his classes and gaining the Coleman medal. He qualified as M.R.C.V.S. in 1877 and took his Fellowship degree in 1882. In 1877 he was appointed Veterinary Inspector at Stranraer under the Veterinary Department of the Town Council under Sir George Brown. In 1878 he was appointed to Ireland under the Irish Privy Council, which at that time, and until the creation of the Department of Agriculture, administered the Diseases of Animals Acts. At that time Professor Ferguson was Veterinary Adviser to the Lord Lieutenant under the Privy Council. On Professor Ferguson's retirement in 1888 Mr. Hedley was made Chief Inspector. His earliest experience, as well as his last, of a serious epizootic was with foot-and-mouth disease. Under his administration pleuro-pneumonia was eradicated and rabies became a thing of the past. Glanders, which re-appeared during the last decade, was stamped out, and Ireland claimed until recently to be free of scheduled epizootic diseases, save for the ever-present swine fever and anthrax. He also was instrumental in stamping out epizootic lymphangitis. He had largely the gift of organization and administration, and to the organization of his branch of the Department the successful handling of the recent outbreak is mainly due.

For many years he was an active member of the Royal Dublin Society, and took part in their shows at Ballsbridge. He was a Vice-President of the Board of Governors of the Royal Veterinary College of Ireland, and took an active part with Sir C. J. Nixon, Bart., in founding that Institution. He was for many years Treasurer of the Veterinary Medical Association of Ireland, and was their President during the years 1899-1901. He was President of the National Veterinary Association at its first visit to Ireland in 1900, and local Secretary at its second visit in 1904. Through Mr. Hedley's arrangements, with the assistance of Sir Charles Cameron in 1898, the veterinary section was instituted at the Dublin meeting of the Royal Institute of Public Health, and made the most favourable impression on the public. Mr. Hedley was a member of more than one Masonic Lodge. He entered Freemasonry in the year 1895. He was a Past-Master in Craft Masonry. He had also passed the chair in Royal Arch Masonry, and was a member of the Knights Templars. He was elected and appointed to represent the Grand Lodge of Louisiana last year, but died before being installed in Grand Lodge. He resigned membership of his mother lodge in 1912, having previously affiliated with Lodge 388, of which lodge he was one of the founders. He was always an active and energetic Freemason, and at the time of his decease was Registrar of Royal Arch Chapter 6.

Mr. Hedley served for a term on the Council of the Royal College of Veterinary Surgeons, being elected in 1892. His hobbies included stamp collecting and amateur photography. He was Secretary of the Royal Photographic Society for several years. He also took up miniature rifle shooting. He was never robust; persistent ill-health extending over many years undermined his constitution. He became so ill in September last that he had to apply for and was granted a period of leave; unfortunately, however, he was never able to return to his duties.

A very large and representative assembly followed him to the grave, including a large number of members of his profession, also members of the Masonic body, who paid him the last Masonic tribute. All his friends and acquaintances, and they are many, offer their sympathetic condolences to his wife and family. He left two sons, one an analytical chemist in South Africa, and the other a dentist in practice in Kent, also a daughter unmarried.

Editorial.

VETERINARY INSPECTORS' FEES.

THE fees paid to veterinary inspectors by the various authorities administering the Contagious Diseases (Animals) Acts have long caused great discontent amongst inspectors employed by local authorities on account of their being really inadequate. In fact, in many cases local inspectors have only sought or retained their positions because they carry with them a certain local standing. But that is no reason why professional men should not be reasonably paid for their services. Many of our readers are already aware of the fact, and we have previously referred to it, that the National Veterinary Medical Association has, through its Council, been giving very thorough and earnest attention to the matter through the initiative of the South-Eastern Veterinary Association. The Council has now adopted a schedule moulded on the Kent scheme for recommendation to the local societies, who must be responsible for carrying it through in their own areas if they wish for it. In some districts inspectors are reasonably paid and are content with their fees, and it is not suggested that they should sow any seeds of discord in their districts by asking for alterations. In other districts, however, the conditions are ludicrously low and absurd, such as Banff, where a veterinary inspector is paid half-a-crown for a visit, and cannot charge mileage for any distance under three miles, and any amount lodged must be sworn to. In such districts, when one asks for improved conditions, one is asked: "How much do you want?" and "What do other authorities pay?" and if one is not prepared with a schedule the whole question is shelved.

It is improbable that the whole schedule will be accepted as it stands by all local authorities, but it offers an excellent basis for negotiation and compromise. As local conditions vary, so must the negotiations be left in the hands of the local societies, each of which should appoint a small committee to make the necessary representations to the powers that be. Their hands will be materially strengthened by the knowledge that they are backed by the whole profession through the National Veterinary Medical Association.

Veterinary inspectors have now got a good lead, and it remains to be seen whether they are willing to follow it and do anything for themselves. The complete success that has been attained by the veterinary inspectors to the County of Kent should instil courage into the most faint-hearted. If improvements of remuneration are not asked for they certainly will not be offered.

General Articles.

ON SARCOSPORIDIOSIS (*SARCOCYSTIS TENELLA*) IN SHEEP IN SCOTLAND.*

(Preliminary Note.)

By J. P. MCGOWAN AND T. RETTIE.

WE have examined four sheep sent to us from the Scottish border and said to be suffering from "scrapie." On three of them comparatively few observations were made during life, but a careful *post-mortem* was done. The fourth, however, was kept under close observation during life, and a thorough *post-mortem* examination was made when the animal was killed. This last animal during life showed the usually recognized symptoms of "scrapie"—namely, great emaciation, pruritus (wool rubbed off and ulcers on nose, top of head and legs; bare callosities at root of tail and on either side of it; attempting to bite the hand used to pinch its side; rubbing against walls, fences, &c.) ; bleaching of wool over back; and persistence of appetite. A secondary anæmia was present. The temperature varied within the limits normal to the sheep, 39° to 40° C.

Post-mortems on the above-noted animals revealed to the naked eye nothing in most cases except strongylosis of the lung and alimentary canal. The only lesion in common to all the animals was a marked sarcosporidiosis, which was not detected by the naked eye, but was first noticed on microscopic examination of the muscles. The last case noted above was most thoroughly examined, and pieces were taken from muscles all over the body. The sarcosporidia were looked for by teasing a small piece of the muscle on a slide and examining it with the low power. Sarcosporidial cysts were easily found in the first piece examined of muscles from the following situations: panniculus carnosus, jaw muscles, facial muscles, tongue muscles, pharyngeal muscles, laryngeal muscles, deep and superficial muscles of neck (back and front), œsophagus, muscles of scapulæ, of fore legs, intercostals, vertebral muscles, heart, diaphragm, muscles of wall of abdomen, and muscles of pelvis and lower limbs. About a hundred pieces of muscle in all were examined.

* Published in the *Proceedings of the Pathological Society of Great Britain and Ireland* for January, 1913.

Sarcosporidial cysts were not found in non-stripped muscle fibres, *i.e.*, wall of alimentary canal, the uterus or vagina. In none of the sheep were there any macroscopic sarcosporidial lesions in the oesophagus.

Acid-fast bacilli (Jöhne's bacillus, &c.), although carefully sought for, were not found in any part of the intestinal canal or mesenteric glands. The central nervous system, the posterior root ganglia, the peripheral nerves, and the skin were examined microscopically, and nothing abnormal observed except inflammatory thickening of the skin.

Sarcosporidiosis as a lesion is well known in sheep. We ourselves have found it in Scotland in sheep other than those suffering from "scrapie." So far as we can find, however, there is nothing in the literature regarding the clinical symptoms produced in sheep by sarcosporidiosis, if we accept the single observation of Moule, who states that in a hundred "cachectic" sheep he found 98 per cent. heavily infected with sarcosporidia, while in a hundred ordinary sheep he observed sarcosporidiosis in only forty-four, and there in small amount. Minchin, quoting Wasielewski, states that sarcosporidiosis shows itself in swine by paralysis of the hind-quarters, a skin eruption, and general symptoms.

Taking into consideration the fact that in each of the four cases examined sarcosporidiosis was present, and that in each we had the opportunity of making a most complete examination—it was not only the only lesion present, but one distributed through the whole body—we put forward, as a suggestion for future work, that the disease "scrapie" may be a syndrome that appears when a sheep is dying of a mass infection with *Sarcocystis lenella*. The sarcosporidiosis may not be necessarily fatal in itself during the economic life of the sheep, but in certain individuals, owing to mass infection, it may assume a fatal character. The pruritus might be explained either by the toxin of the sarcocyst ("sarcocystine" is the only toxin so far isolated from a protozoan) acting on the central nervous system, or by the presence of the cysts in the muscle fibres causing a constant stimulation of the reflex, or by their presence causing an uneasiness in the muscle and inducing the animal to rub.

HÆMORRHAGIC SEPTICÆMIA IN THE SHEEP IN SCOTLAND.*

BY J. P. MCGOWAN AND T. RETTIE.

IN October of last year one of us (J. P. McG.) was asked to investigate a disease which had during the months of August and September caused the death of forty lambs (out of 500) which were feeding on foggage. One of these lambs was by good luck obtained at the moment of death. *Post-mortem*: On skinning, it showed hæmorrhages over all the muscles of the body, especially on the thorax, hæmorrhages on all the serous membranes, effusion into the pericardium (blood stained), innumerable hæmorrhages on the surface of the heart, and hæmorrhages into the wall of the stomach. The animal was very fat. Apart from the hæmorrhages, the only other abnormal thing of note found was acute bronchitis. The spleen was not enlarged, but contained hæmorrhages. The kidneys even so soon after death were very soft. There was no foetid smell (the animal was just dead). *Cultures* made from the lungs gave a rich and pure growth of the organism of hæmorrhagic septicæmia. One c.c. of the heart blood put into an agar slope and spread over the surface gave about a dozen colonies of the same organism in pure state, thus showing a relative infrequency of the organism in the circulating blood. The organism gave all the recognized microscopical (pleomorphism well marked) and cultural reactions of the organism of hæmorrhagic septicæmia. It was lethal when injected intraperitoneally to rabbits, guinea-pigs, rats and mice, killing them within twenty-four hours or even less. Hens were very resistant. The virulence was markedly raised for rabbits by passage; and the heart lesions of the original sheep could be exactly reproduced in the rabbit. After the organism had been subcultured on artificial media for three weeks with several passages through rabbits, to keep up its virulence, three sheep were inoculated with it and all died within less than two days. The temperature of one of them was taken about twelve hours after inoculation, and it was found to be 107° F. The animals showed *post-mortem* practically the lesions found in the original sheep (with the exception of putrefactive changes to be afterwards mentioned).

* Published in the *Proceedings of the Pathological Society of Great Britain and Ireland* for January, 1913.

We will give as an example the details of the experiment in the case of one sheep. A cross dinmont, very fat and healthy, was inoculated subcutaneously into the groin with one forty-eight hours' agar culture of the organism taken from the heart blood of a rabbit which had been inoculated the day previous to its death. This culture was tested for its purity, found to be pure, and gave the reactions of the organism as originally isolated from the sheep. This sheep was inoculated at three o'clock in the afternoon, and was found dead but warm by the shepherd next morning at 8 a.m. The inoculations were carried out on a farm fourteen miles from Edinburgh, where no disease of the kind was known or had been known. The *post-mortem* could not be done till twelve o'clock, some time thus elapsing between death and the time of the examination. The abdomen was much distended and the legs were sticking straight out (owing to the distension), blood-stained froth was coming from the nostrils, and gas was escaping from the anus. There was no external evidence of diarrhœa, such as dirty tail. The animal was very fat. At the site of inoculation into the groin there was slight œdema and congestion. It was, however, no more marked than in the groin of the opposite side. There were numerous hæmorrhages, especially on the walls of the thorax, and the superficial vessels were full of blood. The right lung was œdematous. The upper lobe of the left lung was like a solid blood clot, and the anterior part of the lower lobe was in the same condition. The rest of the left lung was œdematous. There were 2 to 3 oz. of blood-stained fluid in each pleural sac. There was excess of pericardial fluid, which was slightly blood stained. There were a large number of hæmorrhages on the surface and in the substance of the heart. The abdomen was very tense, and on incision being made through the abdominal wall the omentum and intestines bulged out. There was no gas in the peritoneal cavity and no hæmorrhages on the peritoneum. There was a large amount of sanguinolent serum in the peritoneum. The spleen was not enlarged. The liver was firm, but the kidneys were very soft. The rumen was half filled with frothing grass, and blown up tight with gas. The mucous membrane came off in large flakes, showing a congested reddened surface below. The fourth stomach when looked at from the outside showed a very large number of blue plum-coloured spots. The intestines showed some small hæmorrhages and were empty of fæces.

On opening the abdomen, and more especially when the

compartments of the stomach were opened, a very foetid odour (which clung to the hands for days) was given off. Films made from the pleural fluid showed no organisms of any kind, but culture showed the presence of the organism of hæmorrhagic septicæmia and a large rod-shaped organism which was completely anaerobic. The same condition was found in the heart blood. The peritoneal fluid showed the anaerobe in pure condition in films and cultures. Films made from the surface of the fourth stomach showed what appeared to be a pure extensive growth of the anaerobe. Section of the hæmorrhagic patches on the fourth stomach wall showed them to be simply hæmorrhages without any inflammatory reaction. Nevertheless, one sees the large rods right through the thickness from epithelial to peritoneal surface.

In certain investigations in the field during last summer we frequently came across lambs, at the time when they were beginning to eat grass, which had not been seen ailing during life and which had been "found dead." They were very fat lambs and *post-mortem* showed the appearance just described. At this period, however, we never came across one sufficiently non-putrescent to encourage us to examine it bacteriologically. The shepherds invariably called the disease "braxy" or "grass-sickness," and it was recognized by them as a definite clinical entity.

Pasteurellosis is well known as the cause of great loss in France, where it affects chiefly fat lambs and hogs, and there is no doubt the lamb which we originally investigated died from this condition. The chief interest of our investigation centres round the fact that the disease produced by the organism isolated from it, while from the standpoint of morbid anatomy identical with that in the original animal, presented in addition an outstanding characteristic, namely the smell, of another disease—"braxy." There is the further significant fact that, associated with the organism of hæmorrhagic septicæmia, there were in these cases anaerobic rods similar to those described by Hamilton and Nielsen in "braxy." Titze and Weichel some time ago brought forward experimental evidence that Nielsen and Hamilton's organism was of a putrefactive character, and we believe that such a view is sufficient to account for the differences observed, *post mortem*, in our original case of pasteurellosis, and those found in the experimental animals.

It is to be noted that the *post-mortem* descriptions of "braxy" closely correspond with those of pasteurellosis (the gastric hæmor-

rhages, for instance, having led Nielsen to denominate the disease "gastromycosis ovis"). We therefore put forward the suggestion that some, at any rate, of the cases which go by the name of "braxy" may in reality be cases of pasteurellosis.

ABOUT ACARINA—THEIR HABITS, HOSTS, PRACTICAL METHODS OF EXAMINATION FOR, AND LIFE HISTORY.

By THOS. B. GOODALL, F.R.C.V.S., F.L.S.

Christchurch, Hants.

I HAVE been engaged for several years in making a collection of the acarina or mites. Before starting on my last trip abroad, I was desirous to place the collection in safe keeping, and where it would be likely to be of some use, and it was with a feeling of satisfaction that, through the agency of the Linnæan Society, I was enabled to hand it over to Professor Nuttall, who very kindly accepted it for the Museum of the Research Laboratory, Cambridge.

The very fact of searching for and collecting these specimens, some of them unique, led, almost of necessity, to the taking of copious notes, especially of such facts as one failed to find in published works on the subject, and it is a summary of such parts of these notes as I think might be of interest, and possibly of use, to your readers, that I now offer for publication.

It would, perhaps, be as well at the commencement of these notes to say a few words as to what I have found to be the best methods of taking acarina.

A few months ago, at a meeting of the Royal Counties' Veterinary Medical Society, at the Board of Agriculture Laboratory, at Alperton, Professor Stockman gave a demonstration of an elaborate but somewhat complicated method of searching for *Psoroptes ovis* in cases of suspected sheep scab! A scraping of the epidermis was treated with strong liquor potassæ and rubbed down in a mortar with a pestle, washed, and passed through a centrifugal instrument, and the sediment placed under a low power of the microscope—the liquor potassæ would dissolve out all the fat and grease, but it would have no effect on

the hard, chitinous parts of the psoropt, which could be identified under the microscope.

I quite agree that this might be an excellent method in the laboratory, but in the field, or in the case of the general practitioner, I think I can suggest a much more simple plan, one that I have practised for many years, and that I have never known to fail.

In the case of our domestic animals, scrapings of epidermis of animals suspected of being affected by either of the parasitic acarina should be placed in a glass-top box, the bottom of which has been previously lined with blue paper, and with every precaution taken against any escape the box should be placed in the waistcoat pocket (I have one specially made) with the glass towards the body. In a very short time, half an hour to an hour generally, the sarcopts (I am using this term in a general sense), if there are any present, will draw towards the warmth of the body, and can then be easily seen on the glass lid of the box; here they can be identified with a pocket magnifier, and can be transferred without much difficulty to the glass slide for the microscope. For their reception here, I place a drop of Canada balsam in xylol, and with two fine needles placed in handles, taking the parasite up with one, and working it off with the other, they are dropped on to the balsam. The one drawback to this method is that details such as small "setæ" become transparent, and I have sometimes had recourse to glycerine as the mounting agent. Or to study details, a ring of pure Canada balsam is made, the parasites placed in it, a cover glass applied, and before this settles on to the parasites their exact structures and movements can be recorded, and the great advantage of this method is, that the acari generally come into good positions as the balsam closes over them.

To obtain specimens of the acarina from small birds or mammals, I lay the dead bodies on a piece of blue paper, and in a variable time, half an hour with some, and as long as twenty-four hours or more with others, the acari, if there are any, leave the body of the host and come out to the extremities of the hairs or feathers, where they remain for a little time, and from whence, with two fine needles, as described above, they can be transferred to the glass slide for the microscope.

At a later stage they leave the host and will be seen crawling

over the blue paper—they would not be detected on white—and here they can be captured.

I may say, in passing, that we more often than not find some kind or other of the louse mites or others on these small animals if they are treated in this way.

I wish my readers to make special note of this, I consider it of very great importance indeed: many animals, not only small birds and mammals, may be affected with parasitic acarina without giving evidence of their presence during life, but which leave the bodies of their hosts immediately after death. I shall allude to this in my later notes, but I wish to draw attention to the fact here, and further, that unless conveyed by a brush or some such instrument these parasitic acari are slow to leave the skin of one host for that of another during the life of the bearing host; but, this is the important point, *immediately after death* they swarm away from the dead host and seek another, where, once established, they propagate at a tremendous rate. So that when an affected animal is slaughtered it should never be done in the stable or house, or near where others are likely to go, and it would be as well to bear in mind the possibility of our friend, the rat, being a possible carrier of this, as of other diseases, but a deep grave should first be dug, and the animal destroyed, and rolled directly into the grave and covered.

Of course, if a "mangy" rat dies, or is killed, in or near a stable and its body is allowed to remain unburied or unburnt for a few hours, the parasites soon leave their dead host and attack the first they find—a horse; and so *vice versâ*, if the body of a "mangy" horse is not disposed of immediately after death the parasites leave it and attack the first host they find, another horse, or probably a rat, and so the changes may be rung.

I think it very possible that the secret of some of those mystifying outbreaks of intermittent mange in certain stables and kennels will be solved by a better knowledge of the life histories of some of the acarina and an acquaintance with their "bearers" as distinguished from their "hosts."

It is an undoubted fact that many of the non-parasitic acarina are carried to their food supplies by "bearers" of different kinds, beetles, flies, &c., and I should be inclined to expect the same method in the case of the parasitic ones, and I should suggest a very close examination of all living things in the

immediate surroundings of animals that may have been attacked by sarcopts without a satisfactory reason, such as contact with another animal.

In the category of possible "bearers" I should begin with flies, or any other insects that might be in evidence, and, for the purpose of solving the question, as many of these insects as possible should be submitted to expert examination. From my experience with the bearers of other acarina it is probable that not a greater percentage than one in a thousand would be found carrying them, but this one would be sufficient to convey the disease to a horse or other host.

Next I would suggest a very careful examination of cats, rats, and mice in infected premises, and their fleas or lice, which might well be bearers.

A systematic investigation on these lines needs time, money, and co-operation, and also a proper training of a few enthusiasts; it might possibly be done in the Army, where an outbreak of mange is a most serious, and, in times of stress, a most costly matter.

I have given instructions as to the method of capture of parasitic acarina and of dealing with affected hosts. I would supplement this by saying that the method suggested for the examination of the dead bodies of small birds and mammals should be strictly adopted in the case of all small animals taken on infected premises.

A knowledge of the acarina is generally very limited. Pathologists are satisfied with the notion that they are *mostly parasitic*. Gardeners will tell you that the red spider and its ravages is the extent of their knowledge of "mites," and if the subject is broached to one of the general public one is not unaccustomed to get some such assurance as "Oh, yes! I know all about 'mites,' they are bred in cheese," and the idea is that they may wander thence anywhere.

Acarina are almost ubiquitous, they comprise a great order of generally very small creatures, and known as "mites," divided into families, genera and innumerable species, with functions and habits as diverse almost, if not quite, and differing as much in relative size, as those of the great class of mammals, and they play a most important rôle in what Professor J. Arthur Thomson, in his recent book "Darwinism

and Human Life," calls the "Web of Life," the function of many of them being to return to the elements such matters as hair, feather, horn, epidermic scales, and many other such matters as are indigestible by animals, reckoned to be higher in the scale of life.

The distinguishing characteristics of the acarina are: the abdomen is not segmented, neither is it pedunculated, as in spiders, but the thorax and abdomen are fused together in one piece, or generally speaking, the head, thorax, and abdomen are fused together; there is no marked division of these parts of the body as in the insects, such as a fly.

As a rule all the acarina have eight legs when mature; some, indeed, have their posterior legs atrophied and apparently absent, but traces of them can always be discovered, or their absence is an exceptional peculiarity. In their earlier stages they all have six.

The oral apparatus is adapted for biting, or piercing, and sucking. Respiration, as a rule, by trachea.

They are divided into eight main families; some of them are parasitic, some predaceous, others, as their names imply, feeding on various substances, vegetable and animal, as for example:—

Phytophagi.—Vegetable feeders.

Mycophagi.—Fungus eaters.

Glyciphagi.—Feeders on sweets.

Entomophagi.—Feeders on insects (dead ones).

Tyroglyphidæ.—Those that cave out or burrow into cheese, &c.

Rhizoglyphidæ.—Those that burrow into roots or twigs, or suckers of plants.

The following, then, is the generally adopted division of the acarina:—

(1) Trombidiine.—Containing the spinning mites and the harvest mites.

(2) Bdellidæ.—Snouted mites.

(3) Gamasidæ.—A large family of many genera. Many of these are known as the temporary parasites of such insects as beetles, which are really their "bearers" or "carriers."

(4) Ixodidæ.—All the ticks. Some of the large gorged female South African ticks being larger relatively than the myocoptus, as an elephant is larger than a mouse.

(5) Oribatidæ.—Beetle mites. A most interesting family.

(6) Hydrachnidæ.—Water mites.

(7) Halacaridæ.—Marine mites.

(8) Acaridæ.—Containing the (a) Hypoderidæ—subcutaneous mites; (b) Hypopidæ—Ichneumon mites; (c) Tyroglyphidæ—cheese mites and their allies; (d) Sarcoptidæ—including all the itch and louse mites; (e) Phytoidæ—gall mites.

It will thus be seen that the Sarcoptidæ are only a sub-family of the Acaridæ, which are one of the families of the acarina.

The Sarcoptidæ, or itch mites, are divided into two sections.

Section I embraces the (1) Sarcoptes; (2) Psoroptes, or Dermatodectes; (3) Symbiotes.

Section II includes the louse mites, as (1) Myobia—found on many small mammals; (2) Listrophorus—principally in the Mustelidæ; (3) Myocoptes—in mice and shrews; (4) Dermaleichus—found on many birds; (5) Dermanyssus—belonging to the Gamasidæ, I think, should also be included in this section, as it is parasitic on many kinds of birds, especially poultry and pigeons.

(To be continued.)

CONCERNING ANATOMICAL NOMENCLATURE.

By SEPTIMUS SISSON, S.B., V.S.

Professor of Comparative Anatomy in the Ohio State University, Columbus, U.S.A.

It is not the intention in this article to go into the whole question of veterinary anatomical terminology, but rather to attempt to deal briefly with some features of the situation in this regard, in the hope that it may prove helpful in improving our present predicament.

Doubtless no one familiar with the facts will deny that there is great confusion in our anatomical terminology, and some probably would go so far as to characterize the condition as chaotic. A review of some factors in this anatomical babel may assist in working toward a more tolerable status:

The most evident fact is that the number of names is far in excess of requirements, due to the enormous number of synonyms. This imposes on the student a burden which is worse than useless, and is intolerable in the present congested state of the curriculum.

It is not so serious so far as the clinician is concerned, but it is sufficiently annoying to the busy practitioner frequently to encounter in the literature terms with which he is not familiar. Even the experienced worker in anatomy every now and again meets with a name of which the precise significance is doubtful. The writer has kept in close touch for more than twenty years with the literature of this subject, but not infrequently finds—especially in clinical articles—terms with which he is not familiar, although they purport to be anatomical. This multiplicity of terms has arisen in a variety of ways. A majority of the names have been adopted from human anatomy, and some have been applied to structures in animals which were clearly not homologous. Many of the older names were constructed with reference to the horse and are not applicable to other animals. In recent works an effort has been made to correct both of these types of errors. Much duplication has been caused by the translation and adaptation of foreign works by those who were not very familiar with the language of the original or not trained anatomists, or combined both of these defects. Indications are not wanting of what may be conservatively termed gratuitous originality in the manufacture of names. It is high time that it be generally conceded that the determination of anatomical names lies entirely within the province of anatomists. Great damage has resulted from lack of recognition of the fact that if the terminology is to be in any real sense scientific it must be preserved from mutilation by those who do not understand the problems involved and have not the necessary temperament and training to deal with them. The right to an opinion is not congenital but acquired, and there is no royal road to anatomical competence. The present generation of veterinary anatomists cannot properly be held responsible for the confusion in terminology, which is largely an inheritance. The veterinarians of continental Europe are fortunate in the fact that they have been provided, through the efforts of their foremost anatomists, with a uniform set of names which have been chosen with great care. It is sincerely to be hoped that the English-speaking profession will soon co-operate in the substantial adoption of this terminology. As a contribution toward this end, the American Veterinary Medical Association, at its annual meeting in Toronto in 1911, appointed a Committee on Revision of the Veterinary

Anatomical Nomenclature. This committee presented a preliminary report at the meeting at Indianapolis last year, in which were embodied the principles upon which the revision should be based. The more important recommendations were as follows: That each part should have a single name, the official form of which is in Latin. That personal names should be replaced by objective terms, *e.g.*, Ductus parotideus for Stensen's (or Steno's) duct. That related terms shall, as far as feasible, be similar, *e.g.*, Foramen hypoglossi, Nervus hypoglossus; Femur, Arteria femoralis, Vena femoralis, Nervus femoralis. That preference should be given to brief and simple terms, *e.g.*, Dens for Processus odontoideus; Axis for Epistropheus. That names should be applicable to various species as far as possible, relieving us of such terms as Os suffraginis, Extensor suffraginis. With these principles in view the committee is now engaged in the work of revision, and is using the B.N.A. and the names agreed upon by the congresses of veterinary anatomists at Baden and Stuttgart.* With these as a basis the undertaking is greatly simplified, but is still difficult enough—" *periculosæ plenum opus alex*."

Perhaps the writer will be pardoned for referring in this connection to an article by Dr. Stapley, entitled "B.N.A.," which appeared in the VETERINARY JOURNAL (1911, pp. 223, *et seq.*); it escaped my attention at the time in some inexplicable manner, but has lately been read with interest. With much that Dr. Stapley says in that article the writer is in hearty accord. But when Dr. Stapley takes me to task for not adhering to the B.N.A., and states that my text-book was "launched under the flag of the B.N.A.," I am compelled to take issue with him. In the work mentioned no reference whatever is made to the B.N.A. The paragraph in the preface which deals with the matter of terminology is as follows: "Veterinary anatomical nomenclature is at present quite chaotic in English-speaking countries. In this work an attempt is made to eliminate some terms which do not appear to the author to fulfil any useful purpose, and others which are clearly erroneous or otherwise undesirable. In many cases the terms agreed upon by the congresses at Baden and Stuttgart are adopted either in the original Latin or in Anglicized form; otherwise these terms are added in parentheses. The author favours the substantial adoption of this terminology, but considered it

* The Committee (through its chairman, the writer) cordially invites colleagues to favour it with their views on nomenclatural questions.

desirable to offer a sort of transitional stage at present." Thus the book was not launched, neither does it sail, "under the flag of the B.N.A."

Dr. Stapley states that "Sisson has committed an error of anatomical judgment in naming the fused clavicular muscles the mastoido-humeralis; these muscles are all named in the B.N.A., and they should have been given in this book." The name mastoido-humeralis was that found in the only existing text-books of veterinary anatomy of any value in English, and was retained since it was in general use, and did not seem at all highly objectionable. The preferable term, *M. brachiocephalicus*, naturally does not occur at all in the B.N.A., which was written solely to meet the needs of students of human anatomy; neither do the morphological components of the muscle occur in the B.N.A., but they *do* occur in this much-berated text-book of veterinary anatomy, and in no other in English—contrary to Dr. Stapley's statements in this connection. The difficulties involved in working out names which rest on a broad morphological basis, and are hence widely applicable, are very great, and doubtless in some cases insuperable. These difficulties are nowhere greater than in regard to the muscles, and this is true, no matter what basis is selected for the formation of names—chief attachments, action, form, position, nerve supply, &c. There will be general agreement with Dr. Stapley's position that "Functions and structure are most intimately related, and anything tending to divorce anatomy and physiology is against the true interests of these sciences." But functional allusions lead to anatomical troubles sometimes. Thus the *M. extensor carpi ulnaris* of man is also an extensor in the dog, but in the horse, ox, &c., it is a flexor of the carpus. As evidence of the difficulties in this regard, it may be stated that an international commission has been working during the last two or three years on the revision of the names of the muscles in mammals; it does not appear that their labours are yet drawing to a close. The writer is unable to share Dr. Stapley's enthusiasm concerning the happiness of Owen's name "*protractor scapulæ*" for the *omo-transversarius*, and considers the latter term decidedly preferable, for the reason that anatomical names should be framed on an anatomical basis as far as practicable, and not primarily on a physiological basis,

Dr. Stapley takes the ground that "we are compelled to adopt the B.N.A. as a basis of comparison, and we are compelled to adopt it in its entirety." With this position the writer cannot agree. The B.N.A. was not constructed with any such object in view. It was formed for the use of students of human anatomy, and the chief aim was to secure a single, official, Latin name for each gross structure of the human body, thus ridding the nomenclature of human anatomy of a vast collection of synonyms and checking the addition of useless or objectionable new names. It is probable that no thoughtful anatomical worker will question the great value of the B.N.A. in this respect. The failure of the compilers of the B.N.A. to consider comparative anatomical data in framing the terminology is doubtless regrettable and in some respects difficult to condone, but it must be remembered that the situation was very urgent, and it was therefore desirable to afford relief without unnecessary delay. Furthermore, the profound changes involved in a comparative nomenclature would have been quite revolutionary, and would have met with most serious opposition on the part of medical teachers and practitioners. It is quite unjust and erroneous to suppose that the eminent anatomists who framed the B.N.A. were narrow in their outlook or unappreciative of the value of comparative anatomy. It is highly probable that, if they had attempted to make the terminology in any full sense comparative, the commission would still be at work.

The defectiveness of the B.N.A. in this regard, and its evident worth in other respects, stimulated the teachers of anatomy in the continental veterinary schools to undertake a revision of anatomical terminology as applied to the domesticated animals. To this end conferences were held at Stuttgart and Baden, subsequent to a large amount of preparatory work by the conferees. So far as the writer is aware, the results of these labours have not been separately published, but it is understood that the names chosen are substantially those which appear in the recent editions of the excellent hand-books of Ellenberger-Baum and Martin.* It is this nomenclature which the writer used as a basis for changes in nomenclature which occur in his text-book. It is evident that authors of works of this kind cannot be guided solely

* Ellenberger und Baum, "Handbuch der vergleichenden Anatomie der Haustiere"; Martin, "Lehrbuch der Anatomie der Haustiere."

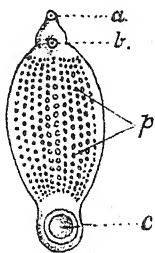
by their own inclinations, but must take into account the attitude of colleagues and the relations to the literature in associated branches of scientific work. If a book is to contribute to progress it must be used, and it is probably the part of wisdom to assist in a gradual evolution. Certainly remarkable mutations occur in Nature, but they are the rare exception.

FURTHER NOTE ON A GASTRODISC (?) FROM AN
INDIAN ZEBU.*

By S. N. MITTER.

Lecturer on Pathology, Bengal Veterinary College.

SINCE I published a paper on a "Gastrodisc (?) from an Indian Zebu" in the *Journal of Comparative Pathology and Therapeutics*, vol. xxv, Part II., I have received a kind letter from Professor A. Railliet, of Alfort, informing me that the specimen was a



The Parasite in question.

Homolostoger. In this connection I desire to mention that Dr. Benham, in his classic treatise on Platyhelminia, Mesozoa, Nemeritim in Dr. Lankester's "Zoology," describes a Homolostoger from the cæcum of *Palonia* (*Bos*) *frontalis*—*Homolostoger paloniæ*, Poirier. It is highly probable that my specimen is a local variety of the same species. The above illustration is taken from Dr. Benham's paper, and may be compared with mine in the *Journal of Comparative Pathology and Therapeutics* as above.

* From the Raymond Research Laboratory, Calcutta, India.

Clinical Articles.

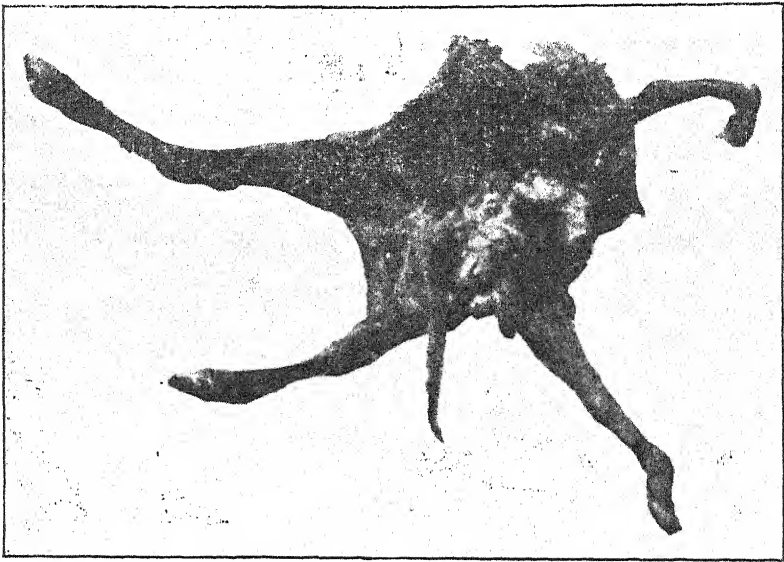
ECTOPIA IN A CALF.

By E. LYNE DIXSON, M.R.C.V.S.

Margate.

THE accompanying photograph shows a bovine monstrosity which may be of interest to others as it has been to me.

My partner, Mr. L. B. Cole, M.R.C.V.S., was called to a case of dystokia in a cow, and on examination found the head and fore-legs presented. Ropes were put on the inferior maxilla and on both fore-legs, but delivery was a physical impossibility, and the cow died.



A Calf Monstrosity.

A *post-mortem* examination revealed the fact that one hind leg was turned forwards to the head, exposing the whole of the viscera, which formed a loop from side to side over the head. It appeared as though the calf had been turned completely inside out.

I have heard of similar cases, but they must be far from common, as is indicated by the fact that although I have been in practice over thirty years I have never before seen anything approaching it.

OVARIOTOMY IN A MARE COMPLICATED BY
ANEURISM OF THE POSTERIOR AORTA.

By A. R. ROUTLEDGE, F.R.C.V.S.

Louth.

THE patient, an aged omnibus mare, was an inveterate, ill-tempered brute, and always *in astrum*. For this reason ovariotomy was decided upon and the mare was cast and chloroformed in the usual way. On making the vaginal incision a sudden rush of blood came over my hand and the mare died of hæmorrhage within five minutes.

Post-mortem examination revealed an aneurism of the posterior aorta the size of a child's head, which had been punctured by the knife.

Had I had reason to suspect it and made a careful rectal examination before operating I should have readily felt it and perhaps have avoided the accident. The rarity of the lesion must be my excuse. The ovaries were cystic and cirrhotic.

THROMBOSIS OF THE RIGHT EXTERNAL ILIAC
ARTERY.

By J. F. D. TUTT.

Class D Student, Royal Veterinary College, London.

Subject.—Bay mare.

History.—Had been previously hunted in Ireland. On arrival in this country she was found to become quite incapable of moving the hind limbs after a few hundred yards' trotting or galloping.

I saw her on September 24, 1912, and had her galloped. Before she had been once round a moderate-sized square field, the groom that was riding her was obliged to dismount, as she was threatening to fall down. Her breathing was very distressed and she could not move for nearly five minutes.

She was then led back into the stable and her breathing did not become anything like normal till quite thirty minutes later, and she broke out into a very profuse sweat. On making a rectal examination, I found that no pulse was perceptible on feeling the right external iliac artery, which was hard to the touch as if it had been injected after the manner adopted in

subjects for dissection. It was very much larger than its fellow of the opposite side, which was quite normal and from which a pulse could be obtained. It was immediately diagnosed as a case of thrombosis, and slaughter was advised.

Post-mortem Examination.—The heart, except for the right side, which was hypertrophied, was sound. Complete thrombosis of the right external iliac artery, thrombosis in aorta, and the internal iliac arteries were partially blocked. I showed the specimen to Sir John McFadyean, who stated that it would be difficult to state its exact etiology, but that it was probably parasitic.

THREE INTERESTING CRYPTORCHID CASES.

By FREDERICK HOBDAY, F.R.C.V.S.

Kensington, W.

THE curiosities and anomalies met with by the "Rig" operator are many, and three which have been recently met with have been sketched and are reproduced here. For the pathological examination and descriptions I am indebted to Sir John Bland Sutton, F.R.C.S.

Case I was removed from a Shire colt, 3 years old. The left testicle was in the scrotum and weighed 10½ oz., the right one being in the abdomen and weighing 1 lb. 9 oz.

It was much enlarged and contained cystic fluid with several pieces of cartilage and bone.

The pathological description is as follows:—

CYSTIC EMBRYOMA OF THE TESTICLE (Fig. 1).

This is a specimen of unusual interest; it is as large as a coconut. On dividing it in a sagittal direction the bulk of the tumour consists of a large cavity filled with fluid, and on its floor there is a lobulated solid tumour the size of a duck's egg enclosed in a thin osseous capsule. The epididymis is easily seen; a small body lying on the wall of the cyst represents the body of the testis, and on microscopic examination seminiferous tubules are easily seen.

The tumour is an embryoma contained in a cyst and replacing the paradidymis. The solid bone-encapsuled body contained within the cyst is made up of embryonic tissue containing secreting glands, tracts of bone, and cartilage.

A cystic testicular embryoma of this nature is a rarity.

Case 2 was removed from a Shire colt, 13 months old. The left testicle was in the inguinal canal and the right one in the abdomen. It weighed $2\frac{1}{2}$ lb. after the fluid was removed. This latter process was done by scratching the cystic portion through with the finger nail whilst in the abdomen; as it was too large to be removed, unless an enormous wound had been made, before this was done.

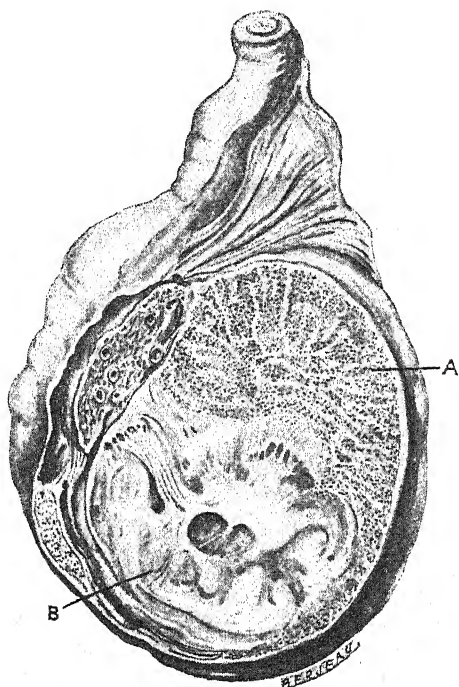


FIG. 1.—Cystic Embryoma of the Testicle. A, Tumour tissue with body of the testicle on the left; B, Cyst cavity.

The pathological description is as follows:—

CYSTIC TESTICLE.

In the drawing, the testicle is represented in sagittal section. The body of the testis is as big as a turkey's egg, and contains three cysts filled with yellow fluid. The cysts are separated from each other by narrow strands of tissue containing seminiferous tubules. The cysts are lined with dense fibrous tissue devoid of epithelium.

Cystic disease of the body of the testis, as seen in this specimen, is not uncommon in rams.

It has nothing in common with the condition known as general cystic disease of the testis in man, for in the latter the disease arises in the paradidymis, between the body of the testis and epididymis, and though the secreting tissue of the testicle is compressed by the tumour the cysts never invade it.

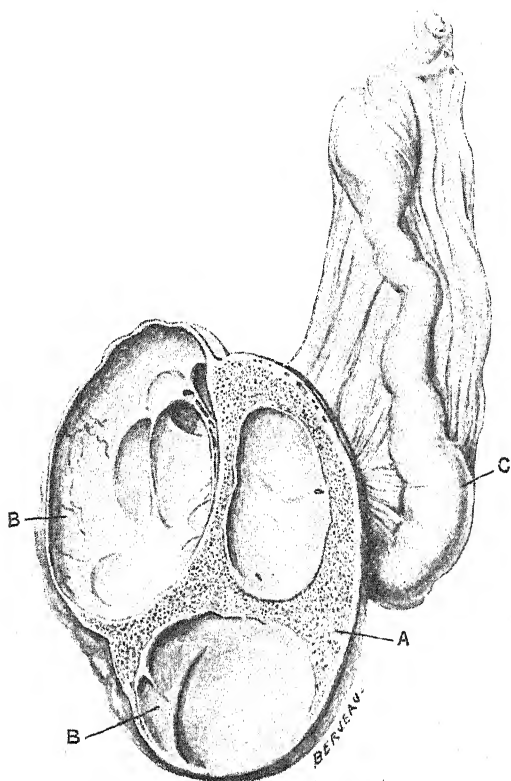


FIG. 2.—Cystic Testicle. A, Testicular tissue; B, B, Cysts; C, Epididymis.

Case 3 was a bay Shire colt, 2 years old. The right testicle was in the abdomen, and weighed $1\frac{1}{2}$ lb.

The pathological description is as follows:—

EMBRYOMA OF THE TESTICLE.

This testicle is about the size of a duck's egg, and the relation of the various parts is represented from a sagittal section of the organ. The testis and epididymis are widely separated from

each other by a mass of tissue having the naked-eye features of fat. This block of tissue compresses the proper tissue of the testis which lies flattened around the periphery of the fat-like mass which replaces the paradidymis. Microscopically the tumour contains the mixed elements of an embryoma. The tissue itself is embryonic in character, and collections of glandular

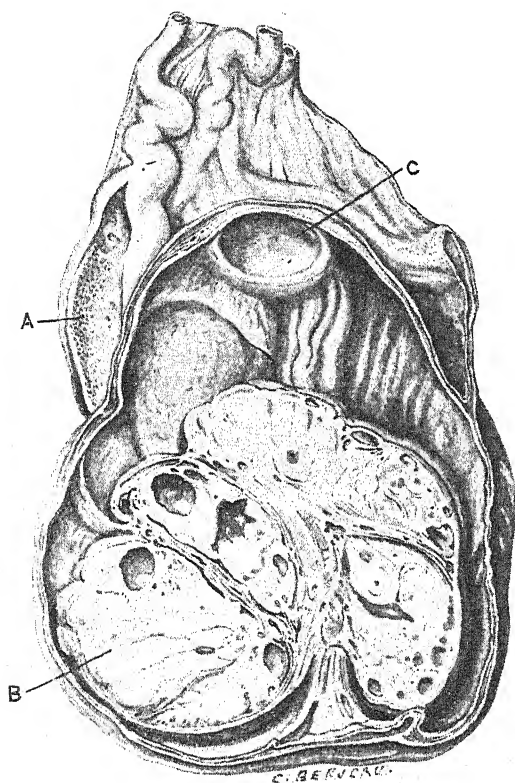


FIG. 3.—Embryoma of the Testicle. A, True testicular tissue ; B, Tumour tissue ; C, Cyst.

tissue resembling the secreting glands of the skin are fairly abundant. Neither hairs nor teeth were detected in the sections.

Each of the horses made a good recovery, and there were no complications to cause anxiety. The operations were done under chloroform, and in each instance the only method of preparation was to paint the skin with tincture of iodine, no soap and water being used at all.

Case 2 is interesting as illustrating that the fluid contents were aseptic, as a considerable quantity escaped directly into the abdominal cavity; this, however, has been observed before both by myself and by other writers.

THE OPERATIVE TREATMENT OF CAPPED KNEE IN CATTLE.

BY DR. A. SALVISBERG.

Tavannes.

THE synovial swelling of the knee in cattle is nothing more than a diseased condition of the bursa on the anterior surface of the carpus.

Siedamsgrotsky considers a capped knee of little significance except as an eyesore.

As regards treatment, almost all authors coincide in the view that cure cannot always be effected. B. Strebel says: "In a few cases treatment is successful, in other analogous cases it is unsatisfactory and even useless."

March has operated on 187 animals by cutting out a half-moon-shaped piece of skin, removing the blood-clot and the internal capsule, suturing the wound and putting on a tar bandage—healing by immediate union.

The view of Siedamsgrotsky undervalues the significance of capped knee. Hygromas as big as a child's head may form and hinder flexure of the joint, so that the animal must always lie with an extended limb. Movement at grazing, too, may be very limited. I have operated on many animals because they could no longer graze and must be stall fed. Just the circumstance that such cows are bad grazers reduces their value; and pedigree animals so affected are greatly reduced in value.

The treatment of knee tumours was a thankless task for me for many years. I had many bad results and few successes. After the appearance of Kallmann's work I thought I could treat this bursitis as effectually as he had done. I, however, obtained no better results than with the earlier treatment. If large quantities of tincture of iodine were injected into the evacuated bursa a painful swelling arose; the animal fell away in appetite, rumination and milk secretion for a few days and pronounced

iodism ensued. March's treatment satisfied me, but on various grounds it cannot be employed by every practitioner. If a bursitis is to be cured the internal capsule must be removed or destroyed so that no fresh secretion arises.

In order to check this serous exudate and to destroy the capsule, I proceed as follows:—

Technique.—With a small barber's clippers I go over the lower half of the swelling. The whole swelling is washed with soap and soda water. The lower clipped half is cleansed with tampons soaked in spirit of ether. In bursitis of the right knee the animal is tied short and pressed up with the left side against a wall. Vicious animals must be controlled with the holders. The limb to be operated on is extended by two assistants and put in a wood block about 30 cm. high. With the pointed bistoury the swelling is incised at the lowest end, and afterwards the incision is enlarged with the blunt-pointed bistoury upwards and downwards for 6 to 7 cm.

It must always be carried as low down as possible so that no pocket arises. With a specially constructed curette the internal lining of the whole bursa is curetted. It is important to act systematically in this procedure and to see that the anterior and posterior wall, as well as the angles, are curetted. The animal bears this well, and takes less notice of it than in incising and cutting the wall of the swelling.

In most bursæ one finds fibrin clots similar to scrambled eggs; these must, naturally, be removed before curetting, and this may easily be done with the curette.

The whole cavity is now packed with a gauze bandage. At first I used iodoform gauze. I have, however, learnt that it is well to kill by irritants little remnants of the internal capsule that remain behind after curetting. For this reason I use a gauze bandage 8 cm. broad, which is soaked in 50 per cent. carbolic spirit. I keep such bandages always prepared in a glass bottle; they become dry after a time and they can be rolled up without irritating the hands. Tamponing must be carried out systematically. With an S-shaped probe the gauze must be well pushed in and the sides and lower portion of the cavity filled. According to the size of the hole one uses six to eight metres of this drying bandage. The packing is left for three days and removed by the owner.

The after-treatment consists in once daily washing the operation wound with a disinfectant. On the day after the operation and for some time the tumour is hard but visibly smaller. Suppuration is always very slight.

I may state here that I have had equally good results in the treatment of capped elbow in the horse with this treatment. Where the wall of the tumour is thick "feu français" may be used with advantage, and is rubbed in at intervals of three weeks. "Feu français" is made up as follows: Canthar. pulv. 25 parts, digested for fourteen days with 300 parts of olive oil and 200 parts of oil of turpentine. Shake well daily. After standing until clear pour off the fluid. This has a number of virtues which other vesicants do not possess. The hair is clipped off the part, which is washed with soap and soda water before applying the vesicant. Useful in cases of pneumonia and all conditions where cantharides ointment is usually applied.—*Schweizer Archiv für Tierheilkunde.*

A CASE OF COMPLETE LEFT-SIDED FACIAL PARALYSIS.

BY STAFF VETERINARY-SURGEON KLINGBERG.

A FEW months back I was called to a horse that had been eating indifferently and had a badly swollen eye. He had been kicked on the side of the head by another horse a few days previously. My examination revealed the following condition on the left side of the head: 3 cm. below the root of the ear I found a hairless place, 5 cm. long and 2.5 cm. broad, covered with a scab. This part was swollen and painful on pressure. The left auricle was lower than the right and inclined backwards. The upper left eyelid was drawn over the globe of the eye more than the right. The conjunctiva was inflamed; the cornea was a milky colour and raw on its surface. In the lower-third of the anterior chamber of the eye there was a blood-clot as large as a bean. Between the conjunctiva and the globe of the eye little foreign bodies, hay seeds, sand, and dust could be seen. The nasal orifice was reduced in size, the upper as well as the lower lip was drawn down to the right side. These changes could be best seen from in front. The taking of food was difficult. The horse grasped the food with his teeth; the food remained lodged between the cheek and the back teeth. In drinking, the mouth

was put into the water beyond the angles of the lips. The left parotid gland up to the root of the ear was rubbed and massaged with iodine vasogen (6 per cent.). The conjunctiva was irrigated with 2 per cent. boric solution in order to remove the foreign bodies between the globe of the eye and conjunctiva. Besides 2 per cent. boric, compresses were used, and a leather shade to the eye. As food the horse received oats, hay, and bran mashes. Since there was no improvement after fourteen days the parotid region was rubbed with cantharides ointment. After five weeks there was a noticeable improvement. After eight weeks there was complete recovery.

Judging from the nerve-supply implicated it would seem that a hæmatoma arose under the parotid as a result of the kick. This hæmatoma exercised pressure on the facial nerve and caused the symptoms of illness described.—*Zeitschrift für Veterinärkunde*.

EPITHELIOMA ON THE TONGUE OF A HORSE.

BY CHIEF VETERINARY-SURGEON DR. KETINER.

FREQUENT protrusion of the tongue on the right side of the mouth was noticed when riding a cavalry horse. On examining the mouth on the left side of the tongue near the attachment of the frænum there was found a flat tumour about as large as a pigeon's egg united by a pedicle to the under surface of the tongue. The outer surface of the tumour showed an irregularly shaped piece of a greyish red colour in its centre about the size of a 2-mark piece; at its edges and on the surface reflected over the tongue it was yellowish white to pure white. On the whole upper surface of the growth there were punctiform hæmorrhages. The cut surface was greyish red and greyish white. The weight of the tumour was 5 drachms. Treatment consisted in snaring the tumour and cutting it off with scissors behind the snare. Cure occurred in ten days. The tongue no longer protruded from the mouth. Microscopic and histological examination showed the neoplasm to be a "papillary epithelioma." The case is of clinical significance as showing that protrusion of the tongue may be due to a tumour.—*Deutsche tierärzt. Woch.*

A NEW TREATMENT OF ROARING.

BY H. A. VERMEULEN.

ARISING from the experimentally proved fact that thyroidea exercises a considerable influence over the degeneration and regeneration of peripheric nerves, and that roaring is caused by degeneration of the left recurrent nerve, thyroidea powder was used to combat the disease. After long continued treatment there was marked improvement. In every case it is possible to check the symptoms of the disease over the fourteen days' warranty time which is customary in the horse trade (in Germany).—*Oesterreichische Woch. für Tierheilkunde.*

PRURITUS CUTANEUS, ITCHING OF THE SKIN OF THE HORSE, AND ITS TREATMENT.

BY CHIEF VETERINARY-SURGEON GAUSSELMANN.

AN article written by Staff Veterinary-Surgeon Kroning (see VETERINARY JOURNAL, October, 1912, p. 613) on "Pruritus Cutaneus" appeared recently in *Zeitschrift für Veterinärkunde*. In that article Kroning refers to my investigations and experiences of the disease.

During the last four years seven patients suffering from the disease have been brought to me for treatment.

Six horses have been cured and the seventh is still under treatment.

In my opinion there is no ground for believing that the complaint is due to bad stables and lack of attention. All seven horses were well tended and housed. The apparently congenital thin covering of hair made possible and favoured a good cure of the skin. Further, according to literature, the nourishing of horses with unaccustomed food-stuffs (maize, vetches, clover) and bad fodder has a causative connection with pruritus. My patients were well nourished throughout and under the same conditions and fed with the same food as a great number of other horses.

In men and dogs nervous disturbances or general malaise have been held responsible for the condition. In no case have I attributed the complaint to another disease, but in two of the horses I have seen papulous-vesicular eczema at the same time.

It appears, therefore, that skin itching may be concurrent with other skin affections or form the basis of them. The symptoms given in literature coincide entirely with my observations. The most frequently involved regions are the neck, saddle region, and the sides of the chest and belly; more rarely one finds local pruritus. The situation of the complaint then is the root of the tail or the base of the mane.

The affected places are covered with a thin, short, lustreless covering of hair. A loss of hair before the occurrence of itching has not been noticed, but during the continuance of the malady gnawing, rubbing and biting caused it to fall out. Generally the skin is not thickened, but dry, leathery, and covered with small scales, at places blood-tinged spots, scabs and incrustations form as a result of gnawing, chafing and biting. The itching arising is at times, especially in winter, small, and at another time the horse shows intense restlessness. In two horses in the summer I noticed this itching combined with papular vesicular eczema under the saddle after severe sweating, but I never saw the complaint spread by grooming utensils or numnahs.

Microscopic and macroscopic examination of scales, scabs, and incrustations gave a negative result.

Four horses had been previously treated, but in three I had the complaint under my care from the first. I at first used many things in spirituous solution and ointment form without success, although I also kept the horses from biting themselves.

I then used a naftalan ointment made up as follows: naftalan, 20 parts; unguentum paraffin, 200 parts; ol. terebinth., 5 parts; and the itching ceased completely.

In all seven horses the skin itching has not returned up to now, but the papular vesicular eczema recurred along with itching in one horse, but was cured in a few days.

In using the ointment the following points are important:—

- (1) The skin must be thoroughly cleansed.
- (2) In case of mane and tail disease both must be cut short.
- (3) All ailing parts and their neighbourhood must be rubbed for half an hour with the ointment.
- (4) The rubbing must be repeated twice in the space of three days.
- (5) Two days after the last application the ointment is washed off.

According to my experience one can dress the animal all over without injury.

With naftalan I have also had good results in scurfy skin, wounds, eczema, burns and excoriations, and insect stings.—*Zeitschrift für Veterinärkunde.*

Canine Clinicals.

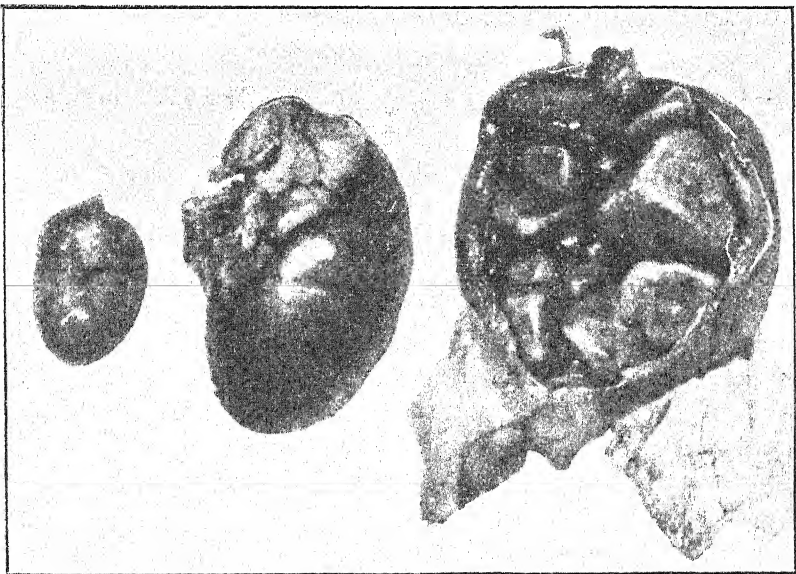
VESICAL AND RENAL CALCULI.

By ARTHUR PAYNE, F.R.C.V.S.

Weybridge.

AN INTERESTING POST-MORTEM FIND.

On January 25 a Pekingese bitch, about 8 years old, was brought to our infirmary, as the owner was leaving home for a few weeks. It was explained to our kennel-man that the bitch



Bladder (filled with calculi) and Kidneys from a Pekingese Bitch.

was in the habit of passing her urine about the house, and the owner fancied that while she was away the dog might be ill-treated by the servants on that account.

Two days later our man informed us that the bitch had died during the night.

Post-mortem showed that the body was fairly well nourished.

The bladder was crammed with calculi from the size of a small walnut downward. I counted thirty-five sizable ones.

The accompanying photograph will also show the relative sizes of the kidneys. The large one contained a cone-shaped calculus, and was appreciably above its normal size.

The small organ was the size of a horse-bean.

A NEW TREATMENT FOR CERTAIN FORMS OF CANINE STIFLE-JOINT LAMENESS.

By ARTHUR PAYNE, F.R.C.V.S.

Weybridge.

THE operation of rowelling, like "blood-letting," has fallen into disuse in recent years. It was performed by our forefathers for the cure or alleviation of various disorders, such as laminitis and pleurisy. During the last few years we have performed a modification of the operation in cases of so-called stifle-joint lameness in dogs with extremely gratifying results.

I suppose that every veterinary surgeon with a canine practice is familiar with, and has been consulted at some time or other by, an owner whose dog has a persistent lameness in the hind limb, the severity of the symptoms, from a slight limp to a dead lameness, depending on the phase of the disease at the time the surgeon is asked to prescribe.

In discussing the case with your client you will observe the dog to stand with the foot of the affected leg slightly behind its fellow; the leg having the appearance of being shorter than the sound one, the toes only resting on the ground, and being turned slightly outwards.

Upon a closer examination the joint may perhaps be found enlarged and firm to the touch.

It is not my purpose here to describe the etiology or pathology of the disease, but to give a general outline of the operation, so that others might give it a trial.

As our patients vary considerably in size, the description given is on the surmise that the patient is a fox-terrier.

A spot is chosen midway between the hip and stifle, and the hair clipped short or shaved, the skin anæsthetized and painted with tinct. iodine.

In long-haired dogs the coat is clipped off the whole of the limb. A vertical incision, about $\frac{1}{2}$ to $\frac{3}{4}$ in., is made through the skin, and a pocket formed by dividing the subcutaneous tissue for about an inch (directed towards the stifle) with a blunt instrument, such as the metal handle of a scalpel.

This pocket is made sufficiently large to accommodate a tightly-rolled pledge of tow (about the size and shape of a small monkey-nut), which has previously been saturated with 1 in 6 cantharides oil and olive oil.

A suture is not always necessary, but I generally make use of one.

This pad is kept in position until a decided reaction has occurred and persisted for a few days; on an average from five to seven days is sufficient. The surgeon will use his judgment as to the fit and proper time to remove it.

I wait until there is marked infiltration downwards to the hock, and a copious discharge from the wound, which must have means of exit.

If a few days after removal of pad the reaction is still very decided and persistent, we wash out the cavity with a saline solution or a solution of boric acid.

The following are a few of the cases operated upon:—

Case 1.—*Black and white field-spaniel*, 9 years old. Lameness, which was very pronounced in the left hind-leg, had been gradually increasing for three or four months, when he was brought to our surgery by the owner, who had recently come to reside in our neighbourhood.

There was no marked enlargement in the stifle, but pain was evinced on pressure and flexure of the joint, and the muscles on the affected side showed marked diminution in size.

The operation was decided upon and duly performed as described. A few days later there was an improvement in the animal's gait, and in six weeks the lameness had practically disappeared. About a year later he was brought to the surgery again, as there was a recurrence of the old trouble.

For a few weeks he was treated with liniments, and internal administrations of salicylates, pot. iodide, &c., with no result.

The operation was performed a second time, and about a month later the dog was sound.

There was no further recurrence of the lameness, and he was

destroyed last week, 13 years old, on account of an enlarged spleen.

Case 2.—*Fox-terrier*, 5 years old. Had been slightly lame in right hind-leg for six weeks. No pain on pressure, but slight symptoms in flexure of joint.

Treated medically for four weeks, accompanied by increasing lameness.

Came to hospital for operation, and in four weeks lameness entirely disappeared.

Case 3.—*Fawn bulldog*, 3 years old. Had been lame in right hind-leg for about four months, during that time had been treated by two veterinary surgeons.

In standing the leg was carried as described in my opening remarks, and was affected occasionally with a spasmodic upward movement, accompanied by a pawing action of the foot.

The operation was not followed by a complete cessation of symptoms, at the same time the lameness was scarcely observable, and in running he would go on three legs for a few steps at times.

Case 4.—*Black Cocker spaniel*, with chronic and increasing lameness. Same treatment followed by soundness in affected limb.

Other cases operated upon include Aberdeen terriers, cross-bred retrievers, &c.

Before bringing these notes to a close I might add that no ill effect has ever followed the operation.

PROSTATITIS WITH AN UNUSUAL CYST IN A DOG, COMPLICATED WITH NEPHRITIS.

By GEO. H. WOOLDRIDGE, F.R.C.V.S., M.R.I.A.

Professor in the Royal Veterinary College, London.

A BIG male dog, a retriever-collie cross-bred, was brought to me at the College with the information that he had been rather dull for about a week, that he was constipated and his appetite very capricious. His previous history was a fairly good one, his only trouble having been a mild attack of gastritis several months before.

On examination he was found to be in rather thin condition, with hollow flanks and pendulous abdomen, and he walked with a very unsteady gait, his hind-quarters reeling, almost like a drunken man. His visible mucous membranes were rather

pallid, pulse weak and frequent, temperature *per rectum* 100.5° F. On manipulating the abdomen, a very tense body could be felt immediately in front of the pubis and extending towards the epigastrium. It appeared ovoid in shape, and pressure caused a little discomfort and the passage of a few drops of turbid urine. This made me suspect a distended urinary bladder. Further manipulation failed to reveal any indication of constipation, the bowels being practically empty (a condition so frequently confused with constipation by the layman). Digital examination *per rectum* revealed this bowel to be empty, and no sign of a prostate body could be felt within the pelvis. The enlarged gland had evidently fallen forwards below the brim of the pelvis and the diagnosis arrived at was enlarged prostate with retention of urine. Passage of the catheter, however, failed to draw off any urine.

The animal was in a very weak condition and obviously could not last long in that state. Laparotomy was therefore recommended to see if the condition could be relieved. The owner, however, deferred consent for twenty-four hours, during which time, in spite of stimulants, the dog got decidedly weaker.

For operation the dog was put under the effects of morphia, and after preparing the site and disinfecting with tincture of iodine, an incision was made through the abdominal wall on the right side of the prepuce. A little ascitic fluid escaped. On examining internally a large body was observed which necessitated enlarging the incision to six or seven inches in order to bring the body out for closer inspection. The urinary bladder was then found to be almost empty, but the prostate was enlarged to about the size of one's fist. Immediately in front of it, and lying directly above the bladder between it and the rectum, was a thick-walled cyst, about the size and shape of a large donkey's testicle, and covered with peritoneum. A vain attempt was made to draw off the contents by means of a small trocar and cannula; a larger instrument was next tried and then an aspirator, both in vain. On withdrawing the cannula it was followed by a droplet of very viscid tenacious fluid, but no flow. The cyst wall was then incised and a large quantity, estimated at about half a pint, of thick, greenish, flocculent material welled out. The cavity of the cyst was then washed out with an iodine preparation and then closed with sutures. The prostate wa

found to be so densely adherent to the urethra and the neck of the bladder as to be inoperable so far as any hope of success could be entertained with a patient in such a weak condition. The abdominal wound was therefore closed with two rows of interrupted silk sutures; stimulants were administered and an unfavourable prognosis given. The patient died about twelve hours later.

On *post-mortem* examination, both kidneys were found to be affected with interstitial nephritis, the pelvis of the kidney in each case was dilated and the cortex contained numerous small urinary cysts. The bladder contained a little urine and its mucous membrane was only slightly congested. The prostate was as large as a big orange, and very dense. The nature and origin of the cyst, however, remain a mystery. No communication could be discovered with the prostate or the urethra. The vas deferens of each side was firmly adherent to it and gave the impression of leading into it. No openings of the ducts could be discovered in the urethra. The lumen of the vas in each case was extremely small and could only just be made out by the naked eye on cross section. One is very diffident in suggesting that the condition represents a rather extraordinary anatomical anomaly, but it would appear as though the two deferent ducts had led into a common blind sac and that the secretions had slowly accumulated. The testes were about normal in size, but were very soft and flabby.

It is probable that the nephritis was the principal cause of the great weakness of the patient.

UNIVERSITY OF LONDON.

PRELIMINARY EXAMINATION IN VETERINARY SCIENCE FOR INTERNAL AND EXTERNAL STUDENTS.

PASS LIST.

301. Housden, Leslie George, Royal Veterinary College.

EXAMINERS.

Inorganic Chemistry: J. A. Gardner, Esq., M.A., Professor H. Jackson, F.C.S., H. R. Le Sueur, Esq., D.Sc., and J. E. Marsh, Esq., M.A., F.R.S.

Physics: J. H. Brinkworth, Esq., B.Sc., G. W. C. Kaye, Esq., D.Sc., B.A., A. W. Porter, Esq., B.Sc., F.R.S., and Professor F. Womack, M.B., B.Sc.

Abstract.

THE AGGLUTINATION AND COMPLEMENT FIXATION REACTIONS IN ANIMALS EXPERIMENTALLY INOCULATED WITH JÖHNE'S BACILLUS, WITH SPECIAL REFERENCE TO THE RELATION OF THIS BACILLUS TO THE OTHER ACID-FAST BACILLI.

(From the Laboratories of the Brown Institution, University of London.)

By C. C. TWORT, M.B., CH.B.,

"Beit Memorial Fellow."

THE disease of cattle known as pseudo-tuberculous enteritis, the clinical manifestations of which are a chronic diarrhœa and gradual wasting of the infected animal, was first described by Jöhne and Frothingham in 1895. Numerous cases have since been reported from most of the countries of Europe and from America, it being recognized at the present time that the number of animals dying annually from this disease is considerable.

In 1910 F. W. Twort and G. L. Y. Ingram succeeded in growing the specific micro-organism, an acid-fast bacillus, outside the animal body, on a medium used by the former for the cultivation of the lepra bacillus of man. In a later paper by the same authors will be found an extensive study of the cultivation of the bacillus and the preparation of diagnostic and therapeutic vaccines.

The medium they used is made up as follows: 75 c.c. egg; 21 c.c. NaCl, 0.8 per cent.; 4 c.c. pure glycerine; 1 gm. dried *Bacillus phlei* previously killed by steaming.

Various other acid-fast bacilli or alcoholic extracts of the same may be used in place of *B. phlei*, full details of which are given in the authors' original papers. This work has since been confirmed by H. Holth in the laboratories of Prof. Jensen at Copenhagen.

The inoculated tubes are capped with gutta-percha tissue and incubated at 39° C. It is best to incubate for about two months when a fairly rich growth is obtained resembling in quantity that of a two months' bovine tubercle culture, recently isolated from the body.

To prepare a bacillary emulsion for animal inoculations one adds to each tube, 1.5 cm. in diameter, 2 c.c. of a 0.85 per cent. NaCl solution, the growth being rubbed off with a sterile pipette or spatula. Great care must be taken to scrape away as little as possible of the underlying medium so as to avoid the production of antibodies to the egg or the nutritive bacilli used in making the medium, by the inoculated animals. An emulsion of the bacilli is then made by shaking for three to six hours in an ordinary electrical shaker. The shaking is carried out in a strong glass bottle fitted with a rubber stopper and containing glass beads of various sizes. This bottle should be half filled with beads and the liquid to be emulsified added until slightly above the half-way mark, *i.e.*, just above the level of the beads; a large quantity of beads with a small amount of liquid give a good emulsion in a comparatively short time. Paraffin wax is then run

round the stopper and the latter securely tied. If the quantity to be emulsified is small, thick test tubes are partially filled with beads and after the addition of the bacilli sealed in the flame and shaken as before. The emulsion thus prepared is immediately inoculated into animals, or at the most kept in the ice chest for a few days.

Owing to the inability to procure naturally infected animals these researches have been almost entirely confined to those experimentally inoculated, the animals used being cows, calves, sheep, goats, rabbits and fowls. Although the two last mentioned do not take the disease they readily produce specific antibodies and invariably succumb when more than one large dose is inoculated (Twort and Craig unpublished). Goats are usually considered to be refractory.

A cow, some calves, sheep and goats each received one inoculation either intravenously, intraperitoneally or subcutaneously. Rabbits and fowls were mostly given two intravenous inoculations, the living bacilli being used in all cases. The second inoculation was made four to five days after inoculation of the primary dose, thus avoiding any anaphylactic phenomena from traces of egg, these appearing from white of egg from the 12th to the 20th day according to the dose (Besredka and Bronfenbrenner). The serums of the animals are then tested at varying intervals, the antibodies not being much in evidence before the second week.

COMPLEMENT FIXATION.

The Wassermann technique has been followed throughout, the complement being titrated each day.

As antigen one prepared an emulsion of the bacilli in the same way as that described above for the animal inoculations with the addition of an hour's heating in the water bath at 60° C. before and after shaking. We have found no advantage in using the living bacilli as antigen.

Serums of thirty-one animals inoculated with Jöhne's bacillus have been tested. A naturally infected Jersey bull with the disease fairly advanced gave a good positive reaction on three different occasions, but as the disease progresses the reactions are becoming less well marked. The serum of a naturally infected cow, in an earlier stage of the disease than the above-mentioned bull, gave a negative result; both these animals had previously received tuberculin. From a cow, given the disease by feeding with a culture of the bacillus, a good positive reaction was obtained, but on *post-mortem* examination tubercular lesions were found in conjunction with pseudo-tuberculous enteritis. Six calves inoculated with 2 c.c. of an emulsion of Jöhne's bacilli, 2 intravenously, 2 intraperitoneally and 2 subcutaneously, gave negative results before and two weeks and three months after the inoculation with the exception of one inoculated subcutaneously, which reacted slightly at the end of three months. Two goats and two sheep only showed a slight reaction six months after intravenous injection. In a number of fowls which received several doses negative results were recorded throughout, whilst rabbits after the second intravenous injection nearly all gave a good positive reaction. Most of the rabbits and fowls used in these experiments have ultimately died, the

quantity of serum injected for each dose being large. We are now endeavouring to obtain serums richer in antibodies by using smaller doses of the living and dead bacilli, and by utilizing other sites of inoculation. The use of partial antigens as described by Much for tubercle is not at present feasible, as we have not a sufficient amount of bacilli at our disposal for extraction.

AGGLUTINATION.

For the agglutination tests an emulsion is prepared in the same way as that used for the antigen in the complement fixation reactions; a young culture is preferable and it is advisable to shake for a longer time. After shaking, the emulsion is allowed to remain for from twelve to twenty-four hours in the ice chest for sedimentation to take place, or it may be gently centrifugalized and the supernatant fluid pipetted off. By this means we have obtained a fairly homogeneous emulsion; indeed, the growing of a homogeneous culture as described by Arloing for tubercle agglutination tests is hardly practicable owing to the slowness of the growth in fluid media and the difficulty of obtaining a culture on potato tubes containing the *B. phlei* extracts. It would also involve the additional necessity of employing extracts of the timothy-grass bacillus instead of the intact micro-organism. Jöhne's bacillus is more easily emulsified than the human tubercle bacillus or Moeller's timothy-grass bacillus; on the contrary it is more difficult to emulsify than the bacillus of avian tuberculosis.

The serums used were the same as for the complement fixation test, the reactions being done with the fresh and heated serums. Half an hour in the water-bath at 56° C. partially or totally destroys the agglutinins for Jöhne's bacillus produced by all the different animals experimented upon with the exception of the fowl. The Jöhne agglutinins produced by the fowl, as those of avian tuberculosis and *B. phlei*, do not appear to be influenced at this temperature. As a preliminary test one drop of the fresh serum is added to four drops of the emulsion and incubated at 37° C. for three to four hours, although a positive serum usually agglutinates long before this time. In any case the controls must be well watched as spontaneous agglutination easily takes place, especially with the living bacilli. For this reason we have no advantage in using living bacilli; on the other hand a positive serum seems to agglutinate the dried bacilli quite as well as the ordinary emulsions of living or dead bacilli, and here the spontaneous reaction is least marked. If the serum give a complete reaction it is then titrated, the same being done with the heated serum. The naturally infected bull gave a good positive reaction on three different occasions up to a dilution of 1 in 15. The naturally infected and experimentally fed cows gave moderate reactions. The six calves all gave a fair reaction three months after being inoculated. The two goats and sheep were negative, but the fowls' serums usually agglutinated well after the second inoculation. Rabbits' serums, on the other hand, reacted less, which is the contrary to that found in the complement fixation tests. The most strongly positive reactions were given by some of the fowls' serums, com-

plete agglutination being obtained with a dilution of 1 in 25. One normal fowl gave a well-marked reaction. The serums of most of the animals used in these experiments, however, were negative before the bacilli were inoculated, a notable exception being a fowl which received one intravenous injection twelve months before the blood was tried and gave a positive reaction with a dilution of 1 in 25.

SPECIFICITY OF THE REACTIONS.

The serums of eighty-eight animals obtained from various sources were tested *re* complement fixation and agglutination with *B. phlei*, human, bovine and avian tubercle bacilli, and Jöhne's bacillus. Jöhne's bacillus was grown on the egg medium containing dried timothy grass bacilli, and the remaining bacilli on Dorset's egg medium. A glycerine agar medium containing *B. phlei* extracts would have been preferable, but unfortunately this does not appear to be suitable for Jöhne's bacillus. All the antigens were titrated on the same day under exactly similar conditions. In a few cases the quantity of serum withdrawn did not enable one to perform the whole series of tests.

As was to be expected the degree of specificity within the acid-fast group was very limited. Usually a serum positive to its homologous bacillus also gave positive results with all the other members of the group, although often in a less marked degree. The question of the relation of avian tuberculosis to Jöhne's disease, and the use of avian tuberculin as a diagnostic vaccine (Bang, Male) led one to think that possibly the avian type of tubercle bacillus would show a closer relation to Jöhne's bacillus than the other tubercle bacilli in test-tube experiments. Our experiments do not appear to lend support to this hypothesis. Fowls and rabbits inoculated with avian tubercle bacilli gave serums that agglutinated an avian emulsion in some cases with a dilution of 1 in 100, while Jöhne's bacilli, although certainly agglutinated, gave very little better reactions than human or bovine tubercle bacilli, or even *B. phlei*. In the same way serums obtained from Jöhne animals agglutinated all five varieties and when titrated showed no marked preference except for its specific bacillus, and in many cases even this preference was not noted. Rabbits and fowls inoculated with *B. phlei*, and rabbits inoculated with human tubercle bacilli, reacted in the same way, most of the human tubercle rabbits, however, gave negative results throughout.

The serum from an advanced case of human leprosy showed no trace of an agglutinin, but the complement was partially fixed with all the antigens used, that with Jöhne's bacilli being least marked. It was found impossible to demonstrate the presence of a specific and of a partial agglutinin by means of Castellani's method. For example the agglutinins in the naturally infected bull's serum and in that of an experimentally inoculated rabbit were entirely absorbed by emulsions either of human tubercle bacilli or of Jöhne's bacilli and subsequent addition of Jöhne's bacilli and human tubercle bacilli respectively, after centrifugalization, &c., gave no agglutination in either case.

The specificity of the complement fixation test was very similar to

that of the agglutination, no appreciable difference being shown with the various antigens. The only normal serum giving a positive agglutination was that of the above-mentioned fowl and possibly the fowl inoculated with one intravenous dose of Jöhne's bacilli a year ago. In this case there was a well-marked reaction with a Jöhne emulsion in a dilution of 1 in 25 whilst with the tubercles it was barely complete at 1 in 5. However, on killing the animal, a microscopical examination of the organ showed them to be normal in structure.

No normal serums gave a positive complement fixation.—*Centralbl. für Bakt. Parasit. u. Infektionskrankheiten.*

Reviews.

The Register of Veterinary Surgeons, 1913. Published at the Offices of the Royal College of Veterinary Surgeons, 10, Red Lion Square, Holborn, W.C. Price 3s. 6d. post free.

We have received a copy of the new Register of Veterinary Surgeons for 1913, and are pleased to note that in every part of the book the necessary revisions and alterations appear to have been carefully carried out. The book contains, in addition to the list of Members of the Royal College of Veterinary Surgeons, copies of the Acts, Charters and By-laws by which the College is constituted and governed; lists of Presidents, Councillors, Examiners, and other office-bearers; and, in the Appendices, full information as to Schools and Prizes, copies of the questions set at the Professional Examinations in all classes in 1912; Regulations for Admission to the Army Veterinary Corps, the Territorial Force, the Special Reserve, the Indian Civil Veterinary Department, and the Board of Agriculture. Useful extracts from Acts of Parliament affecting veterinary surgeons are given, and the Animals (Notification of Disease) Order of 1910 is set out in full. There is a complete list of Veterinary Associations, and a copy of the last Annual Report.

We notice that on page 307 a list is given of twenty-five members who have neglected to inform the Registrar of their change of address. These gentlemen run the risk of having their names struck off the rolls during 1913 under the operations of Section 5 (4) of the Act. We accordingly append the list in the hope that some of the members named, or their friends, may avert the catastrophe. On making inquiries we learn that less than 8 per cent. of the profession purchased copies of the Register in 1912, and this is no doubt one of the reasons why so many veterinary surgeons appear to be unaware of the distinction between the Royal Veterinary College and the Royal College of Veterinary Surgeons.

The Register is a book which should be in the hands of every veterinary surgeon.

ADDRESSES WANTED.

THE present addresses of the under-mentioned gentlemen are unknown. The statutory notices have been sent out by the Registrar, and unless an address is received during the year 1913 the names will not be included in the Register for 1914.

<i>Name.</i>	<i>Last address known.</i>
Barclay, J. D. Dunfermline, Fifeshire
Chisnall, W. G. 105, Goodison Road, Liverpool
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Clinical Diagnostics. By Dr. Bernard Malkmus, Director of the Clinic for Internal Diseases at the Royal Veterinary College of Hanover, Germany. Translated by Dr. D. S. White, Dean of the College of Veterinary Medicine, Ohio State University, and Dr. Paul Fischer, State Veterinarian of Ohio. Published by Alex. Eger, of Chicago. 15s. net.

The first German edition appeared in 1898, and the fourth in 1910. The latter was published in the English language in 1912. The book comprises about 250 pages of clearly printed matter, and many good illustrations. Much labour has undoubtedly been expended in its production, and no one can fail to benefit from a perusal of it.

The definition of the word "diagnosis" on page 11 does not appeal to one as being quite satisfactory; it runs as follows:

"Diagnosis is the art of determining internal changes of the body by the aid of externally visible or otherwise appreciable changes in the animal's condition or some of its organs." The term should not be limited so as to apply only to internal changes.

In referring to the stethoscope the author credits that instrument with being unreliable. In this respect he by no means stands alone, but after some years' constant use of a form of stethoscope, one cannot understand why so many take that view, unless it is because they throw the instrument aside without giving it a sufficient trial. If for six months every case were auscultated both by means of the aided and unaided ear, it is probable that few would rely on the unaided ear at the end of that time. After a little practice, the friction sounds caused by the animals' coats can be disregarded, and there is no need to apply oil or water to prevent them. On page 57, purpura hæmorrhagica in the horse is described as an acute infectious disease, while Hutyra and Marek, in their "Special Pathology," refer to the same condition as an "acute non-infectious disease," and probably most people will agree with the latter. In the paragraphs dealing with anthrax we fail to find mention of the methylene blue reaction; this should not have been omitted.

As a means of diagnosis in glanders, the extirpation of a lymphatic gland for examination is recommended; this may be an interesting process from a laboratory standpoint, but is unlikely to find favour in general practice. On page 164, constipation is said to be the principal symptom of colic. That statement is consistent with the definition of colic (page 35), which runs as follows: "Colic is a complex of symptoms in the horse characterized by abdominal pain and suppressed peristalsis." The term "colic" is so loosely applied, both among authors and practitioners, that it would appear to be a good plan to reserve it for conditions affecting the colon, or to drop it altogether in so far as it applies to abdominal pain. Under the same head in Finlay Dun we find the following: "Irregular inordinate contractions of muscular walls of intestines." Law, after indicating that the term colic is loosely applied to all abdominal pains, finds it necessary for the purposes of his work to use it for "abdominal pain without inflammation or any structural lesion." As used now the word "colic" has too indefinite a meaning and must lead to confusion.

The part of the work devoted to urinary affections is good, and no doubt many of us would act wisely if we paid more attention to the examination of urine. It would be interesting to know how the author attaches a vessel to the horse's sheath in order to collect urine. On page 220, parturient paresis (milk fever) is defined as "an acute auto-intoxication closely following the act of parturition, and characterized by cerebral paralysis." We hope the time may arrive when the real cause of the condition may be an ascertained fact. At present the above definition is perhaps good enough for the purpose of the work, but one must not overlook the fact that cases showing symptoms almost (if not absolutely) identical with those of milk fever may occur before calving, during the act of parturition, and in cows that

have calved several months before the symptoms evince themselves, and in addition they respond to the same treatment as the paresis closely following the act of parturition.

M. J.

The Sheep and its Cousins. By R. Lydekker, F.R.S.
Published by Messrs. Geo. Allen and Co., Ltd.

This work is certain to command a well-deserved attention. It is the result of the energy of an authority already responsible for many books relating to animals, and contains 310 pages of clearly-printed matter, together with 61 useful illustrations. As a reason for its publication Mr. Lydekker states that no other modern book in the English language deals with the chief breeds of sheep in all parts of the world. The work is divided into fifteen chapters, the first of which deals with the names and early history of the sheep.

Chapter ii is devoted to the zoological position and structure of the sheep, and interesting descriptions of the distinguishing features of oxen, sheep and goats, and of the differences between tame and wild sheep are given.

The subject of sheep and goat hybrids is discussed in pp. 31-34, and the authority of Dr. Fitzinger is quoted for the statement that in many parts of Northern Russia domesticated sheep of the short-tailed and frequently four-horned breed are commonly crossed with goats, and that the resulting progeny are, in the main, perfectly fertile, although Mr. Lydekker points out that it is not mentioned whether this means *inter se*, or with one or both parents.

In connection with the sheep of the Faroes it is stated that they feed readily on animal substances—one of the greatest resources in some of the islands for keeping them, when no provender exists, is fish, which are dried on the rocky shores for that purpose.

In referring to merinos the fact that, unlike other sheep, they do not annually renew their fleeces, which will continue to grow for several successive years, is mentioned, and their unpopularity in Great Britain is ascribed to their slowness in reaching maturity, and to their being practically an exclusively wool-producing type.

The sheep of Tibet employed for the purpose of carrying salt and borax over the passes are said to be capable of carrying upwards of forty pounds of salt, done up in two leather bags, slung on either side, at the rate of twelve miles a day, with ease.

Much instructive matter appears in connection with the fat-tailed and fat-rumped sheep; the fat tails of some Persian sheep being from 20 to 40 lb. in weight, and the fat mass on the rumps of Somali sheep weigh about 25 lb.

An Armenian variety is provided with horns of great length; they may measure 40 in.

Chapter xv refers to extinct sheep, and with it terminates an exceedingly interesting book on "one of the most valuable and important of all domesticated animals."

Translation.

TWO CASES OF GENERAL PARALYSIS IN THE DOG.

BY DR. L. MARCHAND and PROFESSOR G. PETIT.

Charenton.

Alfort.

WE have already demonstrated the possible existence in the dog of an affection of nerve centres which is disclosed by symptoms of dementia—both motor and convulsive—very similar to those which characterize general paralysis in man. This affection is anatomically a diffuse and subacute meningeal encephalitis.

Our observations on three cases of this curious disorder have already been published. We have recently obtained data of two other instances which are important enough to be now reported.

Case 1.—A fox-terrier bitch, 15 months old, was brought for examination and treatment to the Alfort Veterinary School. It was placed under the care of Professor Coquot.

The owner said that this bitch had become gradually blind after an accident that had occurred at the age of 12 months. She had been rather severely knocked on the side of her head by a cyclist. She was not stunned by the blow at the time of the accident, and nothing abnormal was noticed immediately afterwards. There was never any appearance of an external wound; merely a splash of mud was to be seen, and no sign of any skull fracture could be perceived.

Since the accident, however, the character of the animal had changed. To begin with, it seemed less lively than before; then, little by little, it was seen to knock itself blunderingly against things. Day by day this trouble increased, until the owner concluded that the bitch had gone blind. Her eyelids no longer blinked, and she took no notice of any beckonings that were made even close up to her. Her eyes no longer followed the movements of the people around her.

Other symptoms presently supervened. The animal's walk became uncertain and tottering. Eventually she seemed to have become deaf; she no longer answered to her name; she did not even seem to hear the sound made by the ball with which she used to play when formerly it was thrown for her amusement by her mistress. The animal showed no pleasure when it was patted; it even seemed to be getting irritable. At last it did not recognize anybody and did not take notice of any other dogs. No circular movements were recorded. When the animal was left to itself it would remain motionless, paying no attention to anything that was going on around it. For some time its habits had become dirty, the excreta being dropped about anywhere, and it urinated frequently without wanting to go out. It never lost its ability to feed itself, and there was no need to put food especially under its nose.

It should be noted, as a possible early manifestation of the malady, that an attack of bronchitis, lasting a fortnight, had

preceded the accident above mentioned, and that the animal had also been suffering from a skin disease, for which medicated baths had been administered.

The patient's brothers and sisters were healthy. Its own health record was incomplete; nothing was known about it before the age of 5 months, when it was acquired by its late mistress.

On examination it was found that the skull was not injured. The eyes appeared normal, although it was noted that the dilatation and contraction of the pupils were sluggish, but there was no inequality, and no lesions were to be found inside the eyes when they were scrutinized by means of the ophthalmoscope.

An iodide treatment was prescribed, but no subsequent improvement was recorded. During the days that followed the animal only vegetated without any sensations. On November 24 it was destroyed by means of an intrapleural injection of sulphate of strychnine.

The Post-mortem.—This revealed no abnormality in the optic nerves and retina and no local cerebral lesions, but *the meninges had a milky aspect and were adherent to the cortex*. The organs of the thoracic and of the abdominal cavities were normal.

THE HISTOLOGICAL EXAMINATION.

The following observations were recorded:—

(1) OF THE BRAIN.—There were no lesions of the optic nerves and retina, therefore *the animal was not blind*. The cerebral pia-mater was infiltrated with embryonic cells scattered over the interior surface; it was closely adherent to the cortex; nuclei of inflammation were prevalent inside the convolutions. There was considerable inflammation round the arteries and veins (periarteritis and periphlebitis), and there were *lesions of diffused meningeal encephalitis* in the cortex.

It was particularly noticed that the amount of perivascularity was relatively greater than the meningeal lesions. The blood-vessels of the white matter were as much surrounded with inflammation as those of the cortex. There were *cellular lesions* that consisted principally in eccentricity of the nuclei, the chromophile granules being preserved. There were numerous subsidiary cells. There was *superficial neurosclerosis* (hardening of the nerves), characterized by enormous arachnoid cells. There was *rarefaction of the tangential fibres* (connecting the sense of touch with the brain); and, finally, there were in the cortex a certain number of *hyaline corpuscles*. The search for microbes was negative.

(2) OF THE CEREBELLUM.—Slight perivascularity in the white substance was observed, but no meningeal lesions.

(3) OF THE MEDULLA.—There was slight sclerosis of the anterior pyramids, but no lesions in the cells of nerve centres.

According to the evidence, therefore, it was a case of meningeal encephalitis in the dog of traumatic origin; but though it had been presumably produced by a blow, it is probable (and such is often the case in human paralysis) that the illness existed before the accident occurred.

The animal did not avoid the bicycle because it could not, its faculty of attention being disordered. The slightness of the shock and the absence of acute cerebral symptoms directly after the accident point to this interpretation.

The mental trouble was shown in this animal by its state of stupor, which made it appear to be first blind, then deaf. This pseudo-blindness and pseudo-deafness resulted from loss of sensations in the patient, whose mental functions had been annihilated.

The diagnostic error seems to us of sufficient interest to be particularly noted.

Case 2.—The following observations have been reported to us by M. Pol Pierre, a veterinary surgeon of Paris, who watched his patient during the later stages of the disease. This distinguished practitioner's most correct diagnosis of *diffused subacute meningeal encephalitis* was made according to the investigations which we had previously published and with which he was acquainted.

The case was that of a bitch who was sister to her father, that is to say, the issue of a mother and son.

At 10 months old she had distemper of the pneumonic type. This appeared to have been completely cured.

The mental trouble began at the age of 16 months by effecting a change of character. The animal lost its former liveliness and left off gambolling. When called by its mistress it would throw itself awkwardly and heavily upon her. The movements were thus proved to be uncontrolled and out of proportion. Convulsive phenomena followed, exhibiting generalized concussion without loss of consciousness. The fits were infrequent, and occurred without any warning. The symptoms became rapidly worse. The animal soon showed great excitement. Its behaviour was absurd; for instance, it would rush at a wall, scratching it for hours with its paws, &c.

The mistress, fearing it was going mad, took it to Alfort School of Veterinary Medicine to be examined. The consultants sent it back four days afterwards, saying there was nothing to fear.

When the animal was 21 months old it was examined by M. Pol Pierre, who reports the following symptoms:—

The excitement (previously noted) had completely gone, the patient appeared to be rather in a state of stupefaction. Its walk was staggering. There was a tendency to fall over on the left side when the animal was induced to move. There were exaggerated patellar reflexes. There was no paralysis or muscular atrophy. Ability to feel pain was retained. The animal could see and hear. Its appetite was ravenous. Though it snarled it did not snap. At this stage there were no muscular spasms nor any tremblings.

The intelligence was considerably weakened. The patient did not move when called by name; it did not recognize its mistress, and, in fact, was quite indifferent to everybody. For a long time the animal had lost control of excretory and urinary functions.

All symptoms became still more acute as time went on. Death occurred at 22 months old.

THE POST-MORTEM.—This was conducted several hours after death. Nothing particularly transpired through the macroscopic examination of the brain, and of the thoracic and abdominal organs.

THE HISTOLOGICAL EXAMINATION.

1.—OF THE BRAIN.—*Inflammatory meningeal-cortical lesions* were manifested over the convex surface of the frontal lobes. They appear to have been identical with those that were noted in the previous case, the only peculiarity being that the perivascularity was less diffused, though the inflammation was very marked around certain blood-vessels. Similar neural and cellular lesions were present. There was also a similar degeneration of the tangential fibres (of touch), which had a granular aspect.

2.—OF THE CEREBELLUM.—Its examination disclosed *subacute meningitis of the pia-mater and diffused infiltration of the molecular layers*.

3.—OF THE MEDULLA.—In this organ there was marked perivascularity of certain interior blood-vessels. There were no cellular lesions.

4.—OF THE SPINAL MARROW.—In this there was slight localized infiltration of the pia-mater. There were no other lesions.

In our former publications we described the symptomatology of *general paralysis* in the dog, and we dwelt on the clinical resemblances of the same malady in canine and human subjects. The differences in the two affections can be accounted for by a consideration of the variations in the material on which they work, as well as in the dissimilarity of the respective virus of origin.

In the animals whose cases we have been studying meningeal encephalitis appears to have begun in two instances at the age of 18 months, and in the others at the ages of 16 and of 12 months respectively. In a fifth case we were unable to ascertain the exact age of the dog. It was reputed to be several years old.

In our experience the evolution of the disorder has always been rapid, and it has lasted a relatively short time. We have not been able to determine its precise duration, because many of our patients were destroyed before the affection had run its course. According to our still incomplete data, general paralysis in the dog lasts from eight months to a year.

When it is remembered that a dog's life is so much shorter than that of a man, and that maturity is reached so much earlier in the animal, considerable allowances will be made for the differences between the usual time of appearance and the duration of the canine and human varieties of general paralysis. There is really not so much difference in these respects as at first appears.

Anatomically the resemblances are more striking. It is true that macroscopically the lesions of general paralysis are not so evident in the dog as in man—the meningeal adhesions being comparatively unimportant in the dog—but microscopically the

diffused meningeal encephalitis in the dog is identical with that in man, so much so that every anatomical pathologist in possession of the facts would unhesitatingly pronounce our specimens to be those of general paralysis, the inherent peculiarities of the dog's cortex being, of course, taken into consideration.

In two cases we were able to discover hyaline corpuscles which have hitherto been supposed to belong only to certain cases of human general paralysis. The malady in the dog seems to supervene several months after an infectious disorder, *i.e.*, that of distemper, the virus of which is persistently penetrating. (Though still undetermined, the cause of distemper may with special significance be verified as a thread-like *spirillum*.)

We must admit a connection of cause and effect between canine distemper and meningeal encephalitis, and we consider that it is comparable to the relation between syphilis and human general paralysis. Still, many more facts are yet to be ascertained before this etiology can be accepted definitely. In any case, there is no denying the interest that is attached to the establishment of the fact that the dog is subject to a malady which is generally (and quite legitimately) attributed to syphilis in man.

Considered in the light of our researches in comparative pathology, meningeal encephalitis in man, notwithstanding its very definite lesions, cannot claim an absolutely exclusive monopoly of special characteristics.—*Recueil de Médecine Vétérinaire*.—Translated by I. S. C.

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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THE LATE MR. WILLIAM BOWER, M.R.C.V.S.

Veterinary Surgeon to His Majesty the King at Sandringham.
Formerly Vice-President and Member of Council of the Royal College
of Veterinary Surgeons.

THE
VETERINARY JOURNAL

APRIL, 1913.

WILLIAM BOWER, M.R.C.V.S.

By the death of William Bower the County of Norfolk has lost a man whose place it will be hard to fill, and the veterinary profession can never fully realize the quiet but important part he really played. Unassumingly and unostentatiously given, his opinion was always the final word, not only with his fellow members, but everywhere amongst his large *clientèle*. As a consultant he enjoyed the absolute confidence of the neighbouring practitioners and he was never known to do a mean or shady action; in fact, he was often alluded to as "the man without an enemy," and everyone spoke well of him.

His own practice included the Royal stud at Sandringham, a responsibility in itself, but one which gained for him the personal approbation of kings; His Majesty the late King Edward in particular, whose fondness for his animals was proverbial. Mr. Bower was often summoned to personally accompany him round the stud, and when discussing the points of this or that brood mare or yearling all the formalities of Royalty would be thrown aside and forgotten by the great man who could assume so well the *rôle* of the county gentleman.

By Her Majesty Queen Alexandra, too, his opinion was held in the highest esteem, and only a few weeks before his death Mr. Bower got up from the bed of sickness to personally attend to the late King's favourite terrier, "Cæsar."

His personal marks of esteem by Royalty have been numerous, but probably the highest proof of all was shown when Mr. Bower was confined to his bed from illness some years ago, and, by the personal command of the King, a message of inquiry was sent from Sandringham to Rudham every morning to obtain a report upon the invalid's progress.

As a Vice-President and Member of the Council of the Royal College of Veterinary Surgeons, Mr. Bower served his profession from 1899 to 1907, and, although not often coming forward as a speaker, his vote was always on the side of progress. In his own district he held all the appointments possible, and in London was often to be seen officiating for one or other of the great horse-breeding societies. As might be expected from a Norfolk man, he bred some good hackneys and for many years was the veterinary surgeon to the Hackney Society. In his younger days hunting was his chief hobby, and hunter breeding also occupied a share of his attention. In the Norfolk Yeomanry he was veterinary officer, retiring a few years ago on captain's rank.

Generous to his employees, the soul of hospitality to his friends, no man was ever more respected by all classes, and his last long illness was borne with the utmost patience and fortitude. A telegram of condolence was sent to the relatives through Mr. Beck, of Sandringham, conveying to them the sympathies of His Majesty the King and Queen Alexandra, and at the funeral there were representatives of the Sandringham estate, the Council of the Royal College of Veterinary Surgeons, the Eastern Counties' Veterinary Medical Association, the Hackney Society, private members of the veterinary profession, and every class of Norfolk society, including, without exception, every inhabitant, rich and poor, of his native village, East Rudham. Truly it was the "passing" of a man who had done good in his generation to his fellow-men.

Editorials.

THE PART PLAYED BY THE PRACTICAL CLINICIAN IN THE PROGRESS OF THE PROFESSION.

THE profession of medicine, whether human or veterinary, is made up of various component parts, each of which *must* pull with the others if the best result is to be obtained. Nowadays everything tends to specialism and it is only by concentration on one particular thing that the deepest and most abstruse problems can be elucidated. This is the case in everything in life and applies equally to the study of disease as to the problems of aeroplaning, engineering, or even to the successful tradesman who cleverly leads the general public to believe that his particular blend of tea, sauce, or even a patent pill is the "one and only" which they must buy.

In the study of disease, it probably deserves greatest credit, and applies to a much greater extent than in anything else, if only for the simple reason that one is dealing with the invisible. Our patients are with us every day, and it is only by keenly cultivating powers of observation, and applying them to daily problems, that we can ever hope to advance. The scientist in the laboratory, free from the worry of how to earn his day's expenses, is lucky in being able to set his train of thought in one direction and keep it there for days, and even weeks and months; but once a laboratory result is attained and confirmed it is necessary that the general practitioner shall be called in to verify these results when carried out under the actual conditions of daily life. Sometimes the results obtained by the one do not accord with the results obtained and reported by the other, and certain differences have to be inquired into and adjusted, but it is always the practitioner who must have the final word. It is he to whom laboratory results must be submitted before they can be tried broadcast, and it is he who will have to bear the brunt of the blame in case of mishap or death. He is, as it were, the "go-between," and his position is one of the utmost gravity.

Even before the disease for which a cure is sought has attracted the attention of the laboratory scientist, it is the carefully observed work of the practical clinician which has been

made use of as a foundation. It is he who has recorded symptoms, the incomplete recoveries, and non-success of various tested methods of treatment for the research experimenter to consider and meditate over, much valuable time being saved by the deletion of those tracks which obviously have not led to success. In fact, the practical clinician who keeps himself up to date is the Alpha and the Omega of the whole affair, and if he would but consider that and record his observations more fully than he does, much greater progress would be made. As one of our greatest living authorities, Mr. William Hunting, once said in our contemporary many years ago: "Careful observation makes a skilful practitioner, but his skill dies with him. By recording his observations he adds to the knowledge of his profession and assists by his facts in building up the solid edifice of pathological science."

The careful recording of clinical cases is necessary and beneficial for progress, and if practitioners would but realize that a little more unselfishly (for, of course, such things take up time which may otherwise be given up to pleasurable pursuits), there would be a much more rapid elucidation of many of the present-day abstruse problems of disease.

THE TUBERCULOSIS ORDER OF 1913.

IN this issue of the VETERINARY JOURNAL we reproduce the above-named Order and we commend a very careful reading of it to all members of the veterinary profession. We unhesitatingly congratulate the Board of Agriculture and Fisheries on the introduction of the Order, which comes into force on May 1, and its principle of compensation. We find, however, that only one-half of the amount payable as compensation for a period of five years is to come from the Imperial Exchequer. To have obtained any such fund is in itself a triumph for the Board of Agriculture and a recognition of the justice of its claim, but it is, we fear, not quite fair, for it will still throw an undue strain on the finances of rural districts. The farmers themselves will have to bear a severe strain in accepting part values in compensation, and it is only fair to ask that a larger proportion of the compensation should be paid out of Treasury grants, so that the dwellers in large towns and cities, on whose behalf the

crusade is mainly being embarked upon, should pay a more adequate proportion of its cost. That this is the main object of the Order is shown clearly by the circular issued by the Secretary of the Board to Local Authorities, who will have to administer the Order. The circular says: "Any action which results in the reduction in the number of tuberculous bovine animals in the country, must reduce the risk of the spread of tuberculosis amongst the community, and if it were possible to eradicate from this country the disease in animals, a material step forward would have been taken in the campaign against the disease in man." The farmer will have to lose either three-fourths or one-fourth the value of his affected animals, according to the degree in which they are affected, as well as paying his share in local and imperial taxation. We consider that is too severe a tax on any one class for the benefit of the community, and hope it will still be possible for a larger proportion of the funds to come from the Treasury and so distribute the burden more diffusely amongst those for whose benefit it is in the main being instituted.

There is, however, another aspect of the case, and that is the benefits that will directly accrue to farmers themselves in eradicating tuberculosis from their herds. We have previously expressed the opinion that it would well repay farmers to rid their herds of the disease without waiting for compulsion, and we still maintain that view. If it were not that the disease is so insidious we feel sure they would have attacked it long since, for it is responsible for incalculable loss, not only in animals' lives and in their condition and market value, but also in the milk yields. There can be no doubt whatever that the great fluctuation in milk yield of individual cows is mainly due to tuberculosis in its earlier and unrecognized stages, and is shown by the frequency with which the cows contract "a cold" or some catarrhal condition and "go off their milk" for several days or a week at a time.

Then how will the Order affect the veterinary profession itself? It is not difficult to realize at first sight that it is the most favourable Order that has ever yet been instituted so far as we are concerned. It should be noted that the veterinary inspector is to be the ruling spirit of the campaign. He is to be solely responsible to his Local Authority and not in any way whatever

under the Medical Officer of Health. There are already signs of movement on the part of the doctors to be brought into it, but they must be made to realize that this is an animal's Order and does not concern them in any way. The veterinary profession must be prepared to carry out the Order, and in diagnosing their cases they must make use of both clinical and laboratory methods. In the latter connection the microscope and the centrifuge must form a part of the ordinary equipment of the veterinary inspector. If some of the older men are not able to make proper use of these they should resign and let some more up-to-date man be appointed, rather than run the risk of the introduction of the Medical Officer of Health on such grounds. This is the veterinary inspector's opportunity. Let him grasp it.

In summing up we are convinced that the Order will be productive of an enormous amount of good results for farmers and the community at large, and in order to obtain those good results it behoves the farmers and the veterinary profession to do their utmost to assist the public authorities to the best of their abilities. The success of the campaign will largely depend on the veterinary profession, who can do so much in the way of advice to farmers and in alleviating many of their fears as to the possibility of unfair treatment. Let us do our duty to our clients and to the community and assist in every possible way in the endeavour to suppress and ultimately eradicate this terrible scourge of man and beast.

THE ROYAL VETERINARY COLLEGE OF IRELAND AND STATE CONTROL.

A STEP of the greatest importance to veterinary education is apparently about to be taken in Ireland, where the Department of Agriculture and Technical Instruction for Ireland has made an offer to the Governors of the Royal Veterinary College of Ireland to take over the financial and administrative responsibility of the College.

The proposals of the Department are: (1) To become responsible for the maintenance of the College, the payment of its staff, the necessary increase of its staff, the necessary upkeep and development of its equipment, and to do all that might be

practicable to bring the College up to the highest degree of efficiency in every respect and maintain it at that level.

(2) To establish the College Research Laboratory on a basis of adequate efficiency, both for the educational requirements of the College, and for the purposes of independent investigations, and to facilitate its co-ordination in regard both to work and to opportunities with all other work in connection with veterinary research done under the auspices of the Department.

We understand that there is every prospect of these proposals being accepted, and we very heartily congratulate the Board of Governors, headed by the President, Sir Christopher Nixon, Bart., on having obtained the proposition, and the Principal, Professor Mettam, on having proved to the authorities that the Institution is indispensable to the State. We hope to refer in greater detail to this matter in a subsequent issue.

We also commend the step to the notice of the President of the Board of Agriculture and Fisheries, and suggest to him that he should do the same with the veterinary colleges of England and Scotland. Moreover, such a step would immensely facilitate the bringing into operation the recommendations of the Departmental Committee on the Public Veterinary Services.

VETERINARY CHARITIES.

WE wish to call the attention of our readers to the announcement on the next page. We have only two charities associated with the profession, namely, the Victoria Veterinary Benevolent Fund, and the National Veterinary Benevolent and Defence Fund, but unfortunately they are not supported as they should be. That is no doubt due to the fact that very few of us are brought into direct contact with necessitous cases. Members of our profession in need through prolonged illness or other causes are prone to hide their wants. Necessitous widows often choose to starve rather than ask for help. But in spite of these facts the attention of the Councils of the two Benevolent Funds are only too frequently drawn to very deserving cases, only to find that their income is all too small to allow of more than meagre assistance. The veterinary profession as a whole is far from a rich one, and only in isolated instances can big donations be made to these funds, but surely

most of us can afford our mite, and certainly one and all of us should subscribe a little annually to one or other.

But on this occasion another opportunity is offered us as the result of spirited work by Mr. Percy Simpson, of Maidenhead, who has persuaded a powerful amateur dramatic society to give three performances in Maidenhead on behalf of the Victoria Veterinary Benevolent Fund, to which the whole of the profits will be devoted. We cannot speak too highly of this generosity, and it remains with us to do our little to ensure its success by taking tickets, and so far as is possible by attending one or other performance. We have previously referred in these columns to the marked histrionic ability of our *confrère*, and we can assure all who attend that they will be more than delighted with the performance.

There are excellent fast trains indicated in the notice between Paddington and Maidenhead, and it should be an easy matter for practitioners in the London district to go to either the *matinée* or one of the evening performances. Others should take tickets for the good of the cause and to show their appreciation of the efforts being made for our necessitous *confrères* or their widows and orphans by Mr. Simpson and his generous and talented friends.

IN AID OF THE VICTORIA VETERINARY BENEVOLENT FUND.

An amateur performance of the domestic drama, "Sweet Lavender," by Arthur W. Pinero, will be given at the Town Hall, Maidenhead, on Wednesday, May 7, and Thursday, May 8, 1913. Doors open each evening at 7.30, commence at 8 p.m. Carriages at 10.15 p.m. *Matinée* on Thursday, 2.30 p.m. Doors open at 2. Carriages 4.45. Reserved seats, 3s., 2s., and 1s., may be booked at Messrs. Dyson and Sons' Music Establishment, High Street, Maidenhead, after April 6.

Any offers of help in the disposal of tickets will be gratefully received by Percy J. Simpson, F.R.C.V.S., Maidenhead, who will also be pleased to book seats on receipt of cheque or postal order for the number of tickets required.

			P.M.	P.M.	P.M.	P.M.
Trains depart Paddington	...	...	12.33	1.50	6.30	6.48
„ arrive Maidenhead	...	...	1.28	2.26	7.3	7.58
„ depart Maidenhead	...	...	4.40	6.2	10.16	11.3
„ arrive Paddington	...	...	5.14	6.38	11.47	11.50

General Articles.

PASTEURELLOSIS IN TURKEYS.

By J. F. CRAIG, M.A., M.R.C.V.S.

Professor in the Royal Veterinary College of Ireland, Dublin.

ON November 9 last a turkey hen was brought to me for *post-mortem* examination by Mr. J. Doyle, M.R.C.V.S., Blackrock. The history accompanying the bird was that it was one of a flock of thirty-two turkeys, same year's birds. Up to the previous day all the members of the flock had been strong and lively, and growing well. Yesterday morning one of the turkeys was noticed ailing, not feeding; at mid-day feed three others were noticed, and at 9 o'clock that night all four were dead and some were showing symptoms. This morning nine in all were dead.

Post-mortem Appearances.—The bird was in fair condition. The liver was clay coloured and soft; the spleen enlarged; a slight deposit of fibrin adhered to the heart and pericardium. The crop was full of grain; there was a great deal of mucus in the proventriculus, and on the posterior half numerous small petechiæ in the mucous membrane. Patches of inflammation were observed throughout the intestines. Peyer's patches were intensely congested, especially near the opening of the cæcal tubes. The contents of the intestines were black and mucoid, save in the rectum, where they were yellowish-white.

Blood films were prepared from the heart blood and stained by various methods, with methylene-blue, Gram and Giemsa. The examination of the films revealed the presence of exceedingly large numbers of bipolar staining coccobacilli identical with those of fowl cholera. They did not retain Gram's stain. They were slightly polymorphous. The bipolar staining was particularly well marked in films stained with Giemsa's stain. Afterwards it was shown that these coccobacilli were not mobile. These organisms were also present in films from the fibrinous deposit over the heart and in large clumps in films from the spleen. The cultural characters were similar to those of the bacillus *avisep-ticus*. On the surface of agar incubated at 37° C. small transparent colours like dewdrops appeared in twenty-four hours, and did not afterwards spread rapidly. On blood serum a thin transparent membrane formed, which afterwards became slightly dull.

A rabbit was inoculated subcutaneously on the inner side of the thigh with three drops of turkey's blood. It was found dead the following morning. On examination of stained films the blood was teeming with coccobacilli. The spleen was dark and engorged. Slight congested patches were observed in the small intestines and lungs. Small hæmorrhages were present at the seat of inoculation. No other experiments were carried out.

The appearances presented were similar to those of fowl cholera, but there is a certain feature of the outbreak that makes one come to the conclusion that the disease is specific for turkeys. The turkeys were running with poultry, and not one single fowl died or showed any sign of illness.

Another feature of interest arises with regard to the origin of the outbreak. The following is the statement of the owners: "We have not introduced any new birds into the place for months past, and never had anything of the sort in the place before, nor have I ever heard of it in this immediate part of the country. Since the birds grew up strong, their principal food has been cooked maize, of which we have used various brands with the best results for several years past. On the Monday previous to the outbreak I had home a new brand made up of maize, beans, and a little barley cooked. The horses are having it with the oats, the cattle mixed with cake, and the hens damped as usual, with no bad results." This change of food is the only source one can point to for the introduction of the disease.

As the result of my examination, I advised the usual precautions to be taken as for fowl cholera; change of the birds from the infected ground to clean runs, separation of the animals showing symptoms from those which were healthy, disinfection as far as possible, and a change of food.

The food was changed to pollard, potatoes, and oats. After these precautions were taken, four more birds died, and then the mortality ceased.

This outbreak appears to present some resemblance to that investigated by Sir John McFadyean in 1893, which he termed "Epizootic pneumopericarditis of turkeys." In the case he described, however, the bacillus was mobile, and pneumonia was a constant feature (it was not present in the turkey I examined).

In 1905, Sydney Dodd described an outbreak of pasteurellosis in turkeys under the heading of "Epizootic penumo-enteritis."

It differed from the present outbreak in that the head was swollen, there was no pericarditis, and the lungs were involved.

In 1908, Jowett recorded an outbreak of pneumopericarditis in the turkey in South Africa, caused by coccobacilli similar to that described by McFadyean.

No doubt all these outbreaks are due to a variety of the same organism which causes a specific disease in turkeys.

THE FOURTH SEASON'S REPORT UPON THE VALUE OF THE VENTRICLE STRIPPING OPERATION FOR "ROARING."

By FREDERICK HOBDAV, F.R.C.V.S., F.R.S.E.

*Honorary Veterinary Surgeon to His Majesty the King, and formerly Professor
in the Royal Veterinary College, London.*

Kensington, W.

NOTWITHSTANDING the criticisms which were made upon the ventricle stripping operation for the relief of roaring when it was first introduced into America and England, the operation still makes steady headway and may now legitimately claim the top place of all the methods which have ever been tried. It has accomplished all that Dr. Williams claimed for it, and, to my personal knowledge, is now being regularly practised in America, France, Germany, Austria, Italy, Belgium, Holland, and Hungary. My own patients now number 695, and I intend, as far as possible, to trace at least 100 of them up for four or five consecutive years, which is quite a good average period of useful life for a horse of the hunter class. The first two were done in September, 1909, and are still at work to the satisfaction of their respective owners.

My opinion now is that it is an operation which will, in a very high proportion of cases (fully 75 per cent.), convert a horse required for galloping (such as a hunter) from a useless into a useful beast; and where carriage and cart horses are concerned (animals used for comparatively slow work), the percentage goes up to fully 90 or even 95 per cent. A certain proportion have become sound enough after the operation to be passed as "sound in wind" by veterinary surgeons, but the operation will never be known as a "dealer's" operation on

account of the fact that even although the horse may gallop quickly enough to pass a test for wind, it rarely loses the habit of "grunting" when threatened.

It is now the fourth hunting season which has passed since the operation was first performed in England and owners are more than ever eager to have their "roarers" done. In preference to the performance of tracheotomy there is no question as to which is the best, and there is no doubt that the most convenient time for all parties is the end of the hunting season, when the animal can be the most conveniently spared for several months to allow firm adhesion of the vocal cord to the side of the larynx and the complete closure of the ventricle.

At first I allowed the horses to be tested at a gallop a month after operation, but I am convinced now that this was an unwise procedure and that a minimum of two months, and better three, should be allowed before violent exercise. This long rest is the chief drawback for the racehorse, as, when it is given, it takes practically five or even six months' careful training in addition to get the muscles back to racing form; whereas, as everyone knows, a tube can be put in one night and the horse raced the next day if required.

The undermentioned list follows in sequence to the two which were published in the VETERINARY JOURNAL for January, 1911, and April, 1912, and the chief purpose of their publication is to controvert the uncalled for and ignorant assertion which was made when the operation was first performed, that it would prove a complete failure, either at once, or else by the merely temporary benefit of its results.

It has *not* proved a failure, and the results are so permanent that over and over again owners who have had a horse done one season have asked for another to be done the next year; and, in some instances, another in a third year, or have even had the hardihood to purchase a whole bunch of "roarers" instead of sound ones. One Master of Hounds, for example, was so well satisfied with his experience of horses done in 1911 that, rather than disperse his stud of tried horses, he had no less than eight animals done; and in another instance a well-known hunting gentleman (who rides a heavy weight) purchased four roarers at the end of 1911, and had them all done, the result being satisfactory both to his hunting and to his pocket.

Case 8.—March 23, 1913. The owner wrote: "I am still of opinion that the operations performed on my hunters were most successful. The bay horse still makes a noise, but goes hunting as of old and merely has to be eased on hills, but as you know he was a very bad case.

"The grey horse is completely cured and makes no noise. They both grunt at the stick, and when leaping. There is practically no sign of the incision left, and the larynx externally feels normal. Neither horse can neigh. The bay horse always discharges a lot of saliva when drinking."

Case 25.—The owner of this animal was sufficiently satisfied to have another hunter operated upon. This horse would go well for about $1\frac{1}{2}$ miles, but would then start to gulp, and appear to be in difficulties. On November 23, 1911, the right side of the larynx was operated upon and a V-shaped portion of the relaxed soft palate was excised. The result was to temporarily benefit the animal, and the horse went back to hunting for some months. The gulping, however, returned, and after the hunting season the horse was shot.

Case 70.—From a letter dated March, 1913: "In writing about the hunter which you operated on some years ago, I can say, as one who has ridden her for several seasons, that since the operation was performed her wind is greatly improved. Across the plough, however, it affects her a little, but on light ground it does not affect her in the least. She could not, however be passed as sound."

Case 79.—March, 1913. The owner wrote: "The horse is certainly better for having been operated upon, as he can work without distress, although one cannot consider him sound in wind. He makes a slight noise on heavy ground and sometimes grunts on landing over a fence. No scar can be detected at the site of operation. When he tries to neigh he makes a slight noise, although at first after the operation he could not neigh at all."

Case 89.—These belonged to a M.F.H., who wrote in March, 1913: "The brown horse that you did a second time is distinctly better; just starting off you can hear him a bit, but after he has gone a very short distance you cannot hear anything, and instead of being useless as a hunter, the longest day or run never distresses him now.

No. of case	Date of operation	Class of horse	Age	Description before operation	Result on first trial	Report in January, 1911	Report in April, 1912	Present report
	1909							
1	Sept. 10	Hunter ...	10	Bad whistler	Excellent ...	Excellent ...	Excellent ...	Excellent.
2	"	"	9 or 10	"	"	"	"	"
	1910							
5	Jan. 25	"	7	Bad roarer	Much improved	Can gallop freely without distress	Satisfactory	Satisfactory.
						Can gallop without distress, although makes noise		
8	Feb. 3	"	10	"	"	Second operation, Aug. 30	Satisfactory	Excellent.
						Practically cured, perhaps a little thick in wind		
10	Feb. 15	"	6	Bad roarer	Excellent	Excellent	Excellent	Sold and lost trace of.
11	"	"	8	Bad whistler	Excellent	"	"	Excellent.
18	April 1	"	7	Roarer	Not very satisfactory	Satisfactory	See notes ..	Hunting well, but still has nasal discharge.
20	April 6	"	...	"	Good...	"	Satisfactory	Satisfactory.
22	"	"	...	"	Excellent	Excellent	Excellent	Excellent.
25	April 10	"	6	Bad roarer	"	"	Satisfactory	Satisfactory.
29	"	"	8	Roarer	Not good	Second operation, Sept. 29. Now satisfactory	"	"
						Slight whistler, but no distress	Satisfactory	Sold ; unable to trace.
31	April 15	Racer	3	Bad roarer	Excellent	Excellent	Excellent	Excellent.
						"	"	Makes a noise again, but can hunt without distress.
40	"	Hunter	5	Bad whistler	"	"	"	Excellent.
41	April 19	"	8	Confirmed roarer	"	"	Since sold for £100	Excellent.
						"	Excellent	Satisfactory.
44	April 23	"	9	Bad roarer	"	"	"	"
45	April 24	"	5	Bad whistler	"	"	"	"

51	April 24	Hunter ...	7	Bad whistler	Excellent	...	Excellent	...	Excellent	...	Sold and lost sight of. Excellent.
53	April 27	"	7	"	"	...	"	...	"	...	"
55	"	"	9	Bad roarer	Satisfactory	...	Satisfactory	...	"	...	Relapsed and was shot.
57	"	"	7	Bad whistler	Excellent	...	Excellent	...	"	...	Sold and lost sight of.
58	April 30	"	7	Bad roarer	Improved	...	Satisfactory	...	"	...	Sold for £200 and lost sight of.
64	May 4	"	...	Moderate whistler	Excellent	...	Excellent	...	"	...	Still satisfactory.
68	May 7	Van gelding	7	Bad roarer	"	...	Satisfactory	...	Satisfactory	...	Excellent.
70	May 8	Hunter ...	6	"	"	...	Excellent	...	Excellent	...	"
71	"	"	6	"	Temporarily better	...	Second operation, Sept. 9.	...	"	...	"
73	May 10	"	16	"	Excellent	...	...	...	"	...	"
79	May 22	"	12	"	Not very satisfactory	...	Still some noise, but hunting without distress	...	Satisfactory	...	Satisfactory, see notes.
81	May 23	"	...	"	Excellent	...	Excellent	...	Excellent	...	Excellent.
85	May 28	Harness horse	9	"	Improved	...	Second operation, August 3.	...	Satisfactory	...	Satisfactory.
87	May 30	Hunter ...	6	"	Excellent	...	Excellent	...	Excellent	...	"
89	June 1	"	9	Roarer	"	...	"	...	"	...	Slight relapse, but still hunting.
92	June 5	"	9 or 10	Bad whistler	Not very satisfactory	...	Now satisfactory	...	Satisfactory	...	Slight relapse, see notes.
93	"	"	7	Roarer	Satisfactory	...	Satisfactory	...	"	...	Excellent.
96	June 9	"	15	Bad roarer	"	...	"	...	Excellent	...	Slight relapse, see notes.
97	June 10	"	9	"	Not satisfactory	...	Excellent	...	"	...	Excellent.
98	June 11	"	8	"	Satisfactory	...	Satisfactory	...	Satisfactory	...	Sold and lost sight of.
100	June 12	Russian Orloff trotter	4	"	Excellent	...	Excellent	...	Excellent	...	Excellent.
101	"	Russian trotter	4	"	"	...	"	...	"	...	Has developed very severe stringhalt.

No. of case	Date of operation	Class of horse	Age	Description before operation	Result on first trial	Report in January, 1911	Report in April, 1912	Present report
	1910							
105	June 15	Hunter ...	6	Bad roarer	No improvement ...	Second operation. Improving	Excellent ...	Relapsed.
106	"	"	12	"	Improved, but still makes noise	Second operation, Sept. 10. Now satisfactory	"	Satisfactory, see notes.
107	June 16	"	7	"	Satisfactory ...	Satisfactory	Satisfactory	Satisfactory.
108	"	"	7	Roarer	Excellent ...	Excellent	Excellent ...	Excellent.
111	June 18	"	10	Bad roarer	Not good (2nd operation Oct. 20)	Now satisfactory	"	"
113	June 23	Shire	3	Roarer	Improved ...	"	"	Has relapsed.
115	June 26	Hunter ...	6	"	Much improved	Satisfactory	Satisfactory	Satisfactory.
116	June 27	"	8	Whistler	Excellent	Excellent	"	"
117	"	"	"	Roarer	Satisfactory	Satisfactory	"	"
118	"	"	"	Bad roarer	"	"	"	"
119	"	"	12	Roarer	Excellent	Excellent	Excellent ...	Died, see notes.
120	June 29	"	"	Bad roarer	"	"	"	Excellent.
121	July 1	Polo Pony	7	"	Improved	"	"	"
122	"	Hunter ...	5	Whistler	"	Satisfactory	"	"
126	July 5	"	8	Bad roarer	Satisfactory	Excellent	Satisfactory	"
127	"	"	9	"	"	"	"	"
130	July 8	"	3	Roarer	"	"	"	"
131	"	"	6	Bad whistler	"	"	"	"
134	July 11	Carriage	7	Bad roarer	"	"	"	Satisfactory.
136	July 14	Hunter ...	6	Very bad roarer	"	"	"	"
137	July 15	"	8	Bad whistler	Excellent	Excellent	Excellent ...	Satisfactory when sold ; since lost sight of.
138	"	"	7	Bad roarer	"	"	"	Satisfactory, see notes.
140	July 21	"	6	Roarer	"	"	Satisfactory	Satisfactory.
141	July 24	Hackney	5	Bad roarer	"	"	"	Has been sold and lost sight of.
145	July 28	Hunter ...	4	Bad whistler	"	"	Excellent. Sold since for £120	Satisfactory. Excellent, see notes.
149	"	Racer	5	Bad roarer	"	"	Excellent.	Sold and lost sight of.
151	Aug. 2	Hunter ..	8	Bad whistler	"	"	"	Excellent, see notes.

152	Aug. 2	Hunter ...	...	Excellent	...	Excellent	...	Excellent.
153	Aug. 3	"	...	"	...	"	...	"
160	Aug. 5	"	...	Slight whistler	...	"	...	Was sold and lost sight of.
161	Aug. 5	"	...	Roarer ...	...	"	...	Satisfactory.
162	Aug. 6	"	...	Bad roarer	...	Not good	...	"
163	"	"	...	"	...	Satisfactory	...	"
167	Aug. 9	Carriage	...	"	...	Excellent	...	"
170	Aug. 12	Hunter ...	...	"	...	"	...	Excellent.
171	"	"	...	Bad whistler	...	"	...	Sold and lost sight of.
172	"	"	...	"	...	"	...	"
173	"	"	...	"	...	"	...	"
174	Aug. 19	Harness	...	Roarer	...	Satisfactory	...	Satisfactory.
176	Aug. 20	Hunter ...	...	"	...	Excellent	...	"
178	"	"	...	Whistler ...	...	Satisfactory	...	Sold and lost sight of.
181	Aug. 21	"	Aged	Roarer	...	Excellent	...	Satisfactory.
182	Aug. 22	"	5	"	...	"	...	Excellent.
183	"	"	6	"	...	"	...	"
185	Aug. 26	Shire ...	3	Bad roarer	...	Satisfactory	...	"
186	"	"	9	"	...	"	...	Satisfactory. See notes.
190	Sept. 8	"	4	Whistler ...	...	"	...	Sold and lost sight of.
191	Sept. 13	"	4½	Bad roarer	...	Excellent	...	Satisfactory.
192	Sept. 14	Trooper	5	"	...	Satisfactory	...	Excellent. See notes.
193	"	"	11	"	...	"	...	Satisfactory.
194	"	"	7	"	...	Excellent	...	"
195	Sept. 17	"	6	"	...	"	...	"
196	"	Carriage	5	Roarer	...	Satisfactory	...	Relapsed and been tubed.
197	"	Hunter ...	12	"	...	"	...	Satisfactory. See notes.
198	Sept. 18	"	8	"	...	"	...	Satisfactory.
199	Sept. 20	"	5	Bad roarer	...	"	...	"
203	Oct. 1	"	12	"	...	"	...	"
204	Oct. 4	"	8	Roarer	...	Bad ...	...	See notes.
205	"	Pony	9	Bad roarer	...	Satisfactory	...	Satisfactory.
206	Oct. 7	Hunter ...	Aged	Bad whistler	...	Excellent	...	Now dead.
208	"	"	7	Whistler ...	...	"	...	Excellent.
216	"	Harness	5	"	...	"	...	"
	"	"	8	"	...	"	...	Satisfactory.

"The grey horse does not get in the least distressed, but you can hear him a bit, but nothing like he was just before you did him.

"The bay horse is an absolute cure, and you cannot hear him at all."

Case 93.—On March 19, 1913, I received a note from the owner: "The chestnut hunter you did the second time showed no improvement from the second operation. This season the noise has increased and stops him a good deal, especially on foggy days."

Case 106.—On March 11, 1913, the owner wrote: "I am sorry to say the horse you operated on, Weatherbit, got such a bad over-reach the end of last season, he had to be destroyed. I am still of the same opinion, the operation did him no end of good; I rode him hard after it and he was never once distressed, which he used to be in heavy going before you operated on him."

Case 107.—In March, 1913, the owner wrote: "Last season I rode him hard right through and he never seemed to be badly blown. I found that if he was not pushed too hard at the commencement of a run, say, after the first ten or fifteen minutes, he improved, and could go on as long as you liked, especially with average going. Of course, I never rode him before his operation, but from what I hear it has improved him immensely."

Case 108.—In March, 1913, I had a letter to say: "The operation has certainly enabled me to hunt the horse without distress. During the season 1911 I considered it a wonderful cure, but this season he certainly makes a bit of noise, but nothing like he did before the operation; one notices the noise going down wind more than galloping up wind. I am exceedingly pleased with the operation, for it has enabled me to hunt the horse, which otherwise would have been quite impossible. I do not detect any scar. The larynx feels quite normal. The horse tries to neigh when his stable companion comes in, but it is a curious sort of noise and certainly could not be called a neigh."

Case 116.—In March, 1913, I received the following from the owner, a well-known racing gentleman: "I have hunted the chestnut gelding, which was a whistler, for two seasons since the operation and he has got no worse.

"In regard to the bay gelding hunter—a whistler—operated

on during the summer of 1911, this animal was quite sound during the first half of the hunting season 1911-12, then began to stop going up hills, and later he would not go at all and was shot.

"Black mare, thoroughbred, in training, a whistler, quite cured, and won a race on the flat after the operation.

"I consider the operation highly satisfactory."

Case 117.—In March, 1913, the owner reported: "Six months after operation I got my old horse's head under a poisonous pool in St. Leonard's forests, and subsequent to this there was considerable discharge from the nostrils. After this he always made a good deal of noise (not as much as before). He sees me through any hunt in Sussex and has twice run a respectable third in our local heavy-weight Point-to-Point. You operated only on one side of his larynx."

Case 118.—This horse died during the summer of 1912 and I had the opportunity of examining the larynx, which was partly ossified and had a granulation about the size of a pea over the ventricle, which was perfectly closed. The latest report had been that the animal could hunt without distress but made a noise.

Case 136.—March 22, 1913. The owner and the stud-groom each wrote: "The black horse was shot early last season, as he went lame from navicular disease. He was all right as far as his wind was concerned, and it never stopped him in the least."

Case 145.—Letter from Mr. Q.: "This horse was passed sound in wind by one of our most eminent hunting veterinary surgeons and is still in possession of the same owner, who purchased him last season for £120."

March 24, 1913. The owner wrote: "The chestnut horse you operated on went on well. My son hunted him the following season and he stood the test well. I do not think he missed a week from hunting. I sold him, and he has been carrying a First Whip all this season, so I think this a proof that the operation was very successful."

This horse was passed at the time of sale "sound in wind" by one of our most critical hunting veterinary surgeons, and in a letter received a few days ago he said he was still sound.

Case 151.—March 22, 1913. The owner wrote: "I am glad to say that John Peel is as sound as a bell in his wind, except on thick foggy days, when he makes a peculiar thick noise. He

been performed. It is very certain (*vide* numerous owners' remarks) that it is of no use to rely upon visible evidences of the scar at site of operation, and this I am able to confirm, for on several occasions I have myself been completely deceived. In fact, in some instances I would defy anyone to detect this until the hair was shaved off.

ABOUT ACARINA—THEIR HABITS, HOSTS, PRACTICAL METHODS OF EXAMINATION FOR, AND LIFE-HISTORY.

By THOS. B. GOODALL, F.R.C.V.S., F.L.S.

Christchurch, Hants.

(Continued from p. 112.)

I PURPOSE now to give a few notes, with some illustrations, of such of these mites as have come under my own observation, which I trust will be of some interest. It is not my intention to dwell on the better known ones, but just a few that are not so familiar.

Sarcoptidæ.—We probably know more about this than any other family of the acarina, and it is important that it should be so, and that our knowledge should be accurate.

We are apt to forget that other animals, besides man and his domesticated ones, harbour the sarcopt. The rat is a favourite host, and is affected in this way. *It is a very common occurrence indeed*, especially in the winter months, to find about the thin skin of the ears of rats a number of what look like raised pustules, some of them as large as small shot-corns; if these are carefully opened with fine needles, they will be found to contain one or more of the sarcopts. What is of further interest is that these agree in size and general appearance with those found on the pig; this may be of importance or not, I don't know. I have had no opportunity of experimenting, but it raises an interesting question.

On two or three occasions I have found swine badly affected with sarcoptic scabies; in these instances the parasites were found more or less distributed over the skin on the upper parts of the body; on the sides and flanks there were patches of scurvy scabs, and the sarcopts were found under these scabs, deeply

embedded under the epidermis. To secure the parasites *deep* scrapings had to be taken; in fact, the skin was scraped until it bled.

Symbiots are always found on the parts of the body where there is abundant "waxy" secretion; in the ears of dogs and cats, about the heels of horses, and about the orifice of the interdigital gland, and the interdigital spaces of the sheep, and the symbiots are rather erratic as to the symptoms caused by their presence, for, though they cause great irritation at times, they may be present in great numbers without giving rise to any symptoms of uneasiness.

I once, with a friend who was a doctor, saw a kitten that had just been killed; as it belonged to him he knew that during life it had every appearance of being perfectly healthy and well, and yet directly after death the symbiots came swarming out of the ears.

Twenty-one years ago I published an article in THE VETERINARY JOURNAL on "The Symbiots of the Sheep," and mentioned the fact that I then had two affected sheep under observation, and I took some considerable trouble in watching carefully the symptoms caused by the symbiot of the sheep. I bought two sheep from an infected flock, and kept them in small pens, moved from day to day, in a paddock of my own. I had them caught, and closely examined them almost daily, and kept a record of what I found, with the instructive and interesting result that some days there were no symbiots at all to be seen, on others they would be swarming, and on others there would be one or two or just a few, sometimes on one foot, sometimes another. Without doubt these sheep were affected all the time though the parasites were not always in evidence; they had travelled to some other part of the body where they could not be seen. This is an important fact to those experts who may be called upon to deal with parasitic skin disease in any form. I have kept the record of these cases, which I give later.

I have recorded the case of my friend the doctor's kitten; as a fact, it is probably unusual, but as there was no doubt about this particular case, *i.e.*, the kitten being badly affected, and yet showing no symptom of uneasiness even during life, it is possible that cases of the kind may be of more frequent occurrence than might be supposed.

For the benefit of those who may not have been called upon to diagnose and treat this auricular symbiosis of the cat, the symptoms are, generally, great irritation, a constant shaking of the head, and scratching at the side of the face, under the ear, with the hind claws; in prolonged cases one often finds the side of the face quite raw from this cause, and sometimes there is a slight discharge from the ear; in looking into the ear there will generally be seen lumps of what look like dry wax. Having got this far in the diagnosis, I generally borrowed a small hair-pin from the owner (they are almost always ladies), and with it scooped out a piece of the waxy-looking material, then, holding this up to the light, with my pocket magnifier I could always find the parasites when present; I could generally show them to the owner, to her astonishment, and sometimes horror!

Having satisfied one's self as to the presence of the parasites, the treatment is comparatively simple; it consists in taking a little olive oil and oil of stavesacre, one part of the latter to eight of the former, warming it to about the heat of the body and dropping it into the ear, then working it well down by rubbing the outside of the cartilage of the external meatus, wiping off the superfluous oil, with the dissolved wax and the parasites it brings away, with cotton-wool, burning this—and let the cat go. It is as well to warn the owner beforehand what is likely to happen, because, generally for half an hour or so, the patient is nearly frantic with the irritation, caused probably by the disturbance of the parasites. However, as, I suppose, they die, the host regains her composure.

This treatment should be repeated daily for about three days generally; it is sometimes as well to have a look in again after about a week, but almost invariably this treatment is followed by a complete cure in a few days.

Record of the observations of two sheep from a flock in which foot-rot was prevalent, and in several of which I had found the *Symbiotes spathiferus* (var. *ovis*).

August 5, 1891.—Two sheep purchased. The interdigital spaces of both of them were infested with the symbiots. They were placed together in a small pen, and fed on grass, oats, and a little oil-cake.

August 8.—Feet examined. No. 1.—Long-tailed sheep. The interdigital spaces of both fore-feet were dry and rather dirty.

looking; no symbiots visible with the naked eye, but in both hind-feet in the interdigital spaces, and in one foot round the orifice of the interdigital gland, the symbiots were very distinctly visible. Where they were the most in evidence there was the least scurf.

No. 2.—Symbiots visible to the naked eye in the hind-feet, not in the fore. There was the raw surface of a broken blister, half an inch in diameter, by the side of the opening of the interdigital gland in the right fore-foot, probably the result of "chafes" in catching and carting the sheep. A small, hard, crusty scab running lengthwise at the bottom of the interdigital space of the right hind-foot. I secured specimens of the symbiots from under this scab.

No lameness in either sheep, and nothing to indicate anything abnormal to a casual observer.

August 13.—No. 1.—Feet very much the same. The surface of the skin in the interdigital spaces is moist and shiny. Symbiots very plainly visible to the naked eye, particularly in the left hind-foot. No lameness, and nothing to indicate the presence of the symbiots to a casual observer.

No. 2.—The same appearances as No. 1, except that there are no parasites visible to the naked eye, and there is a little redness and slight tumefaction of the nude patch of skin surrounding the orifice of the gland of the near fore-foot; there are also slight papules on the heel under the pastern of this foot.

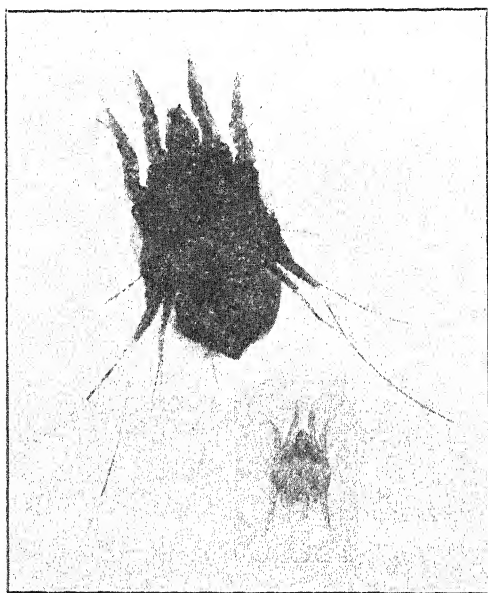
I fancied this sheep was slightly lame on the near fore.

August 15.—No. 1.—The parasites have increased in numbers very much; they may be seen in groups in the interdigital spaces of all four feet. In both fore-feet they are seen on the bare skin round the orifice of the interdigital sac, and on the off fore-foot this patch of skin is pink in colour. The skin on the interdigital spaces is drier than on August 13.

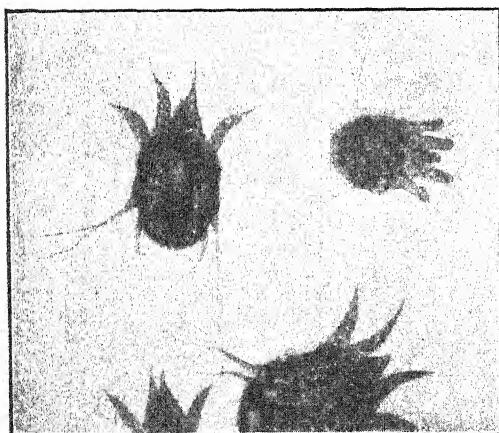
No. 2.—Almost exactly like No. 1. The parasites very plainly visible in groups on each foot. The bare skin round the orifice of the sac of the near fore-foot is slightly inflamed. The symbiots are plainly visible on this patch of skin, and also *in* the orifice of the sac.

No lameness in either sheep. This was a bright, sunny day.

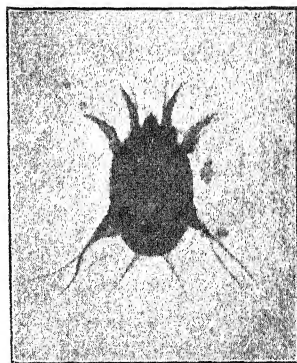
August 17.—A dull, overcast day. The parasites can only be distinguished with the greatest difficulty. No lameness. The



Symbiotes spathiferus (var. *ovis*), female. Inset, male.



Psoroptes communis (var. *equi*).



Psoroptes communis (var. *felis*),
from cat's ear.

skin apparently a little thickened and irregular on its surface in the interdigital spaces.

August 19.—No. 1.—The symbiots can only be seen with the naked eye in the fossa in the interdigital space of the left hind-foot. There is a slight abrasion, with a speck of blood visible, on the skin between the digits of the right hind-foot. The parasites cannot be seen with the naked eye on more than the one foot, but the other feet are very "scurfy" between the digits.

No. 2.—The symbiots cannot be seen with the naked eye on either foot. There is a slight abrasion, with a speck of blood, on the skin between the digits of the left fore-foot. All the interdigital spaces are very dirty.

We have been having heavy storms of rain during the last few days, and this is an unsettled day as regards weather, heavy storms and bright sunshine alternating.

August 21.—The abrasions noticed on August 19 are better, they were probably caused by a slight scratch with "bents" of grass.

No. 1.—There is a noticeable "creamy" discharge from the orifice of the interdigital sac of the near hind-foot; this discharge sticks on the skin round the orifice, and there are several of the symbiots to be seen *under* the dried discharge, and *round*, and *in* the orifice of the sac.

I cannot see the parasites in their old habitat (the fossa between the digits). I see no changes in the other feet.

No. 2.—The feet are all apparently healthy. There was a deluge of rain all yesterday afternoon and during the night, which may have induced the parasites in No. 1 to change their habitat.

August 24.—No. 1.—The near hind-foot is the best to-day; the off hind-foot is "sweaty" in the interdigital space. The two fore-feet are a little "sweaty"; a trifle "full" about the orifices of the interdigital sacs, and below these towards the interdigital spaces. There is hard wax protruding from the orifices of the sacs. Symbiots are very plainly visible on all the feet.

No. 2.—All the feet are dry; orifices of sacs rather full-looking, and semi-hard wax protruding from each, otherwise there is no abnormality. Symbiots are plainly visible in the fossa of each foot.

August 26.—No. 1.—All the feet dry again, and symbiots visible on each foot.

No. 2.—No change since last inspection, except that the skin of the near hind-foot is slightly red. This sheep is not quite well to-day. We have been having exceedingly rough, boisterous, wet weather, and this may have affected this sheep.

August 29.—No. 1.—All the interdigital spaces are *shiny* and moist, the two fore-feet more so than the hinder ones. In the off hind-foot I saw a *red* acarus, but was unable to capture it. The symbiots were plainly visible in all the feet.

No. 2.—Symbiots visible only on the two hinder feet, and *not* in great numbers. The skin of the interdigital space of the off fore-foot was shiny and moist.

September 2.—No. 1.—Symbiots literally in swarms in the fossa of all four feet, there were also a good many of them round the orifices of the interdigital sacs of both fore-feet; these sacs were slightly full-looking, otherwise all the feet looked quite healthy.

No. 2.—Symbiots in swarms in the fossa of all four feet. All the feet are looking quite healthy.

We have had a prevalence of rough, windy, wet weather, strong south-west gales, since my last examination.

September 5.—No. 1.—No symbiots are visible to the naked eye on any of the feet. All the feet were "scurfy," and, on scraping the scurf away, a few of the parasites could be seen. There is a distinct hard swelling, the size of a pea, in the interdigital space, close to the coronet, and by the side of the fossa of the near hind-foot.

No. 2.—No symbiots visible to the naked eye. The skin in the interdigital spaces shiny and scurfy; a few of the symbiots to be seen under the scurf of the fore-feet. In both hind-feet there is a swelling of the interdigital integument, nearly the length of the coronets, on both the inner and the outer digits, leaving a kind of canal along the centre. There is no heat or lameness.

Since my last examination the weather has been bright and clear with cold, frosty nights.

September 8.—No. 1.—Symbiots plainly visible in colonies on both fore-feet; one to be seen on the hind-feet, but the skin in the interdigital spaces of both hind-feet is shiny, "oily," and has a pink blush.

No. 2.—Symbiots only plainly visible on the left fore-foot; the other three feet have the skin shiny, oily-looking, and there is a pink blush on each.

Since the last examination the weather has been bright and warm.

September 11.—No. 1.—Symbiots very numerous on both fore-feet, and round the orifice of the sac in the left fore. In the left hind-foot there is a small pustule by the side of the fossa in the interdigital space; in the right hind-foot there are two pustules, one on either side of the fossa, the inner one being a trifle the larger. No symbiots visible on either hind-foot.

No. 2.—Parasites visible in left fore and left hind-feet, and there is slight redness and swelling of the skin in the interdigital space of the left hind-foot.

No parasites visible in the other two feet, which appear quite healthy.

Since the last examination the weather has been exceptionally hot during the day, with heavy, cold mists during the night.

September 15.—No. 1.—Symbiots visible in fairly large numbers in both fore-feet, both in interdigital spaces, and round the orifices of the sacs.

The left hind-foot shows slight separation in the horn at the coronets in the inner faces of the digits.

On the inner side of the inner toe there is a white swelling extending a little down the toe from the coronet at the point where the *soft* horn commences immediately behind the *furrow*, and there is a slight separation of the horn of the toe just in front of this.

On the outer toe there is a slight separation in the upper part of the horn in the inner face. The separation commences at the part that corresponds to the fossa. The horny commissure is "cheesy" and unhealthy-looking.

In the off hind-foot there is only the remains of an old pustule.

No parasites visible in either hind-foot.

No. 2.—There are no symbiots visible in any of the feet. In the off hind-foot there is a scab where a pustule had healed normally.

The sheep is a little unwell.

September 15.—I to-day made an examination of several of the sheep in the flock from which I procured my two. These

sheep, like my own, have been quite sound up to within the last few days.

I found one old ewe with dry scabs and scales both in the interdigital spaces, and round the claws at the back of the pasterns. These were all very itchy, and for the first time I found the parasites at the pastern, though this was the only sheep where I did so find them.

Symbiots were very numerous in the feet of some of the sheep, and not to be seen in others.

Some of the sheep are now very lame; in every case the first manifestation of disease is a small papule on the side of the fossa, and a cheesy appearance of the horny commissure.

This papule in some cases becomes vesicular, but always descends, by enlargement, towards the toe; in most cases the hind-feet are first affected, and generally the inner toe is the worst.

The papular enlargement appears to alter the character of the soft horn immediately behind the furrow. The hard horn in front of this separates, and as the swelling descends there is also separation, and a space formed between the sensitive and the horny soles.

One very noticeable feature is, that the feet may be severely affected, and the disease far advanced before there is the slightest lameness. In one sheep particularly the papular swelling had extended quite to the sole of the toe, and there was at least half an inch of the hinder part of the hard horn of the toe separated and under-run, and *also* a space between the sensitive and non-sensitive soles, and *yet no lameness.* The sheep was caught at haphazard.

In one or two of the most lame of the sheep foreign matters had become insinuated between the spaces caused by the separation of the horn.

To return to the examinations of my two sheep.

September 18.—No. 1.—In both hind-feet there is a roll of hardened wax protruding from the orifices of the sacs, and the parasites are to be observed round the orifices.

Right hind-foot.—The angry look of the papules has gone, but there is a thickened swelling of hard white skin, rough on its surface, on each side of the fossa.

Left hind.—The skin is pink, and only one roughened swelling on the outer side of the fossa.

The parasites are swarming in the right fore, and some are visible in the left fore-foot.

No. 2.—Symbiots in greatest numbers in the left fore interdigital space. In lesser numbers in the other feet, all of which are otherwise healthy.

The weather has been humid and warm since the last examination.

September 21.—No. 1.—In both hind-feet the soft parts of the horn on the inner faces of the digits are bulging under the posterior edges of the toe-claws, the bulging extending from the coronets down the feet.

There is a papular swelling on both sides of each fossa.

For the first time I notice to-day the symbiots are burying themselves in swarms under epidermic scales in the fossa *under the pasterns* of both hind feet. The skin here is irritable and itchy and has a decidedly "scabby" look.

There are a few parasites in the interdigital spaces of both fore-feet.

No. 2.—In the right hind-foot there is a slight swelling in the interdigital space.

The symbiots are but sparsely visible in the interdigital spaces, but *very plentiful under the pasterns* of all four legs. Here also, as in No. 1, the skin is irritable, very scaly, and "scabby" in appearance.

It is as well to note here that, though Turn states that the symbiots are found under the pasterns and about the scrotum or mammary gland, I have always searched for them in these regions, and this is the first time I have seen them anywhere but about the feet.

The weather has been generally warm, with occasional showers of rain since the 18th.

September 26.—No. 1.—Both fore-feet swarming with symbiots in the skin in the interdigital spaces, and I notice a great many also where I have not seen them before—on the inner coronets of the digits. There are some also to be seen round the orifices of the sacs. There is a roll of hard wax protruding from the orifice of the sac of the right fore-feet.

Right hind.—The symbiots are in great numbers in interdigital space and under the pastern; they are also to be seen on the skin of the inner coronets.

The horny septum is ragged, and is becoming a little separated from its attachment at its anterior margin.

The inner coronets are puffy, and there is a small hard swelling on each side of the fossa.

Left hind.—The skin is dried up and a little shrivelled. Symbiots are swarming in the interdigital space and under the pastern.

No. 2.—A little swelling of the coronets on the inner face of the digits of the left hind-foot.

Parasites plentiful in interdigital spaces of both hind-feet, but only half a dozen or so in each of the fore-feet.

The weather has been warm and wet since the last inspection.

I was in London on the 23rd and busy since my return, hence the longer interim.

October 2.—No. 1.—Feet all healthy again, hardened wax protruding from the orifices of the sacs of both hind-feet.

Symbiots are seen round the claws of the pasterns *only*. None in the feet!

No. 2.—Feet healthy. Parasites under the claws of the pasterns of all limbs and round the orifice of the sac of the right hind-foot.

We have had much rain since the last examination.

Changed the sheep to new ground.

October 5.—No. 1.—A few parasites seen in the interdigital spaces of both fore-feet and a good number in the near hind: this foot is scaly and red in the interdigital space.

The symbiots are under all the pasterns.

No. 2.—No parasites to be seen in the interdigital spaces, but they are visible under all the pasterns.

Weather fine and warm during the day, and cold at night, since the last examination.

October 8.—No. 1.—No parasites visible in any of the feet, but in numbers under the hind-pasterns.

The skin on either side of the fossa in the interdigital spaces of both hind-feet is swollen.

The soft horn on the inner aspect of the digits of both hind-feet, and also the horny bridge, ragged in appearance, and the hard horn of the toes is cracking at edges and apparently separating.

No. 2.—Parasites only visible under the pasterns. Hind-feet have the same appearance as No. 1, only more modified.

Weather exceptionally wet since last examination.

October 15.—No. 1.—No parasites visible on any of the feet or limbs.

The horn of the left hind-foot is slightly broken, and skin of the interdigital space pink. All the other feet are healthy.

No. 2.—No parasites are visible, and all the feet are healthy.

The weather has been very wet.

October 24.—No. 1.—Symbiots to be seen in the interdigital spaces of all the feet; most numerous in the right hind.

The left hind has white pustular-looking swellings on either side of the fossa, the horn of the toes is very much broken, and there appears to be a "discharge" on the skin of the interdigital space.

No. 2.—Parasites to be seen on all the feet; most numerous on the hind.

There have been persistent drenching rains almost daily; weather not cold. Yesterday and to-day finer weather—foggy, and inclined to be frosty to-night.

November 2.—No. 1.—Fore-feet healthy; parasites seen at pasterns only. In the right hind interdigital space there are a few, and great numbers in the near hind. The near hind is very scurfy.

No. 2.—The skin of interdigital spaces of all four feet, and also under the pasterns, is covered by a thick dirty scurf; the hind-feet are the worst. Here and there, both in the feet and under the pasterns, there are spots of a glutinous exudation. The parasites are in swarms under the scurf, and there are a few round the orifices of the sacs.

The weather has been fine, but cold; frosty during the nights.

November 5.—In both sheep the parasites are in great numbers in the interdigital fossa of all four feet; most numerous in the hind. There are also a few round the orifices of the sacs. There is a good deal of scurf round the claws under the pasterns, but I do not see many parasites in this locality.

The weather has been cold and dry since last examination.

November 12.—There are only a few parasites visible in the interdigital fossa of the feet of both sheep.

Weather has been very changeable, but fearfully rough and stormy for the last few days.

Returned the sheep to flock. They have since been badly

affected with foot-rot, which has been amongst the flock all the autumn.

I have taken note of the weather after the first few examinations, thinking that possibly that might have some influence on the "migrations" (I can think of no better word) of these parasites.

The sheep were comparatively clean on grass at any place. Afterwards they, with the whole flock, were penned out on roots.

(To be continued.)

Clinical Articles.

URETHRAL CALCULUS IN THE HORSE.

By E. B. REYNOLDS, M.R.C.V.S.

Professor in the Royal Veterinary College, London.

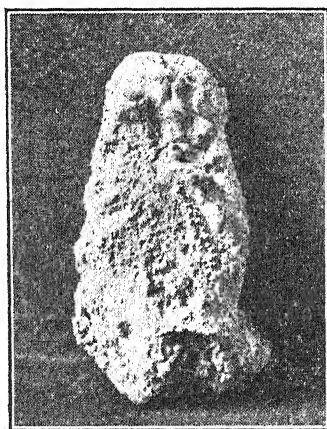
THE subject of this note was a bay nag gelding, about 15 years old, which had been found in pain first thing in the morning.

No improvement being shown after the administration of two colic draughts at an hour's interval, further advice was sought. The animal, when seen, was exhibiting considerable continuous pain—apparently abdominal—walking round in a crouching attitude and occasionally lying down, though not remaining down for very long. Frequent attempts at micturition were made, a few drops of urine dribbling away at each effort. The completely drawn penis, the raised tail and the definite effort to stale were in such marked contrast to the usually half-drawn penis and the slightly stretched position so commonly seen in cases of intestinal pain, that some urinary obstruction was suspected.

Rectal examination revealed a greatly distended bladder. No obstruction could be felt on digital examination of that part of the urethra extending from the bladder to six or seven inches below the ischial arch, but on attempting to pass a catheter a hard substance was encountered in a position about ten inches below the ischial arch. The owner's diagnosis that the animal was "touched in his water" was thus proved truer than is generally the case.

The owner's consent to an operation being obtained, the horse was cast, casting being necessary owing to the position of the

urethra between the thighs at the point of obstruction. *Bull's* belt and ropes were used for casting, as providing both a less likelihood of injury to the distended bladder, and also the best means of securing the animal for operation. After chloroform had been administered, the calculus was cut down upon and removed. The details up to the point of removal call for no comment. The bladder and whole length of the urethra were examined to ascertain that no other calculus was present, and then irrigated with a warm solution of boracic acid. The operation wound was well disinfected—a 2½ per cent. solution of kresophen being used. One of two courses could then have



Urethral calculus ; actual size.

been followed, either to leave the wound open and allow it to heal by granulation, or to suture. This latter method was adopted. The edges of the deep portion of the wound, consisting of the divided corpus spongiosum and the accelerator urinæ muscle, were brought together by closely placed, interrupted, fine silk sutures, the mucous membrane of the urethra not being included in the sutures. The wound in the perineum was treated in a like manner.

The following day there was some swelling and a slight oozing of blood-stained liquid (not urinous) from the lower part of the wound. The bottom two stitches were cut and some blood clot removed, the wound syringed with 1:1,000 chinisol solution and the sutures again inserted.

From then onwards recovery was uninterrupted, healing taking place without suppuration. The sutures were removed on the seventh day.

The markedly successful result obtained in this case by closing the wound appears to suggest that this method might more often be followed.

The picture of the calculus in the accompanying photograph shows its actual size.

The history of the case—it was said the animal had been noticed to have difficulty in staling for a week or two—the elongated shape of the calculus, its irregular surface, and the low position down the urethra, suggest that part, at least, of its formation had taken place in the urethra.

A SPINAL CASE.

By CLEMENT ELPHICK, M.R.C.V.S.

Newcastle-on-Tyne.

A NINE-YEAR-OLD chestnut Russian pony gelding, in first-class condition. Has been in owner's possession since a rising four-year-old. On two previous occasions, an interval of twelve months between each, he has shown loss of control of the hind legs and a reeling gait, and from each trouble he made a good recovery after physic and a holiday at grass.

On February 4 I was called in to see him on this his third attack, and he had then been affected in his gait for four days. Found the pony standing and quite at ease and eating; on moving him from his stall for inspection he showed loss of control of the hind legs, crowding, platting of the hind legs, and rolling. Responded to pin pricks until the last two or three dorsal vertebræ were reached, proceeding from before backwards. Rectal examination revealed nothing.

Applied hot water rugs, followed with an embrocation to the whole spine, and gave opening medicine. Racked the animal close and warned the owner not to let him down. Did not think slings advisable.

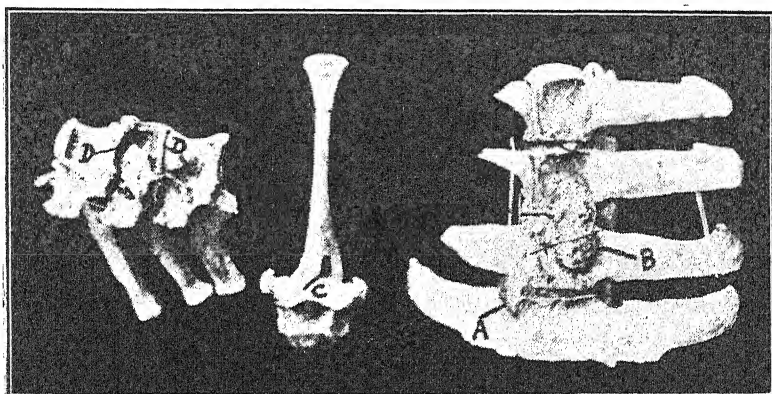
Prognosis very unfavourable.

Hot water and embrocation treatment carried up to the 10th, when I received word that pony was down and in extremis.

Advised destruction, which was carried out.

Post-mortem.—Unfortunately I did not attend the examination as I thought I had only a fractured spine to deal with. The lesions point somewhat strongly to tuberculosis of the spine, and the slaughterman informed me that the kidneys and spleen were "not right."

The photograph shows on the first joint of the lumbar an old ball callus, A; on the second joint a more recent one and in a state of active disease, B.



Vertebral spine showing ossification at A and B and necrotic processes (C and D.)

Marked necrosis of the bodies and interarticular surfaces of the dorsal vertebræ, D, and enlargements into the spinal canal.

Necrosis of the bases of the spines of the dorsal vertebræ from the fourth to the seventh, C. I have shown the lesions to two medical practitioners, and they say that the lesions resemble in a marked degree those found in the human being in cases of tuberculosis of the spine.

INVAGINATION OF THE CÆCUM.

By CLEMENT ELPHICK, M.R.C.V.S.

Newcastle-on-Tyne.

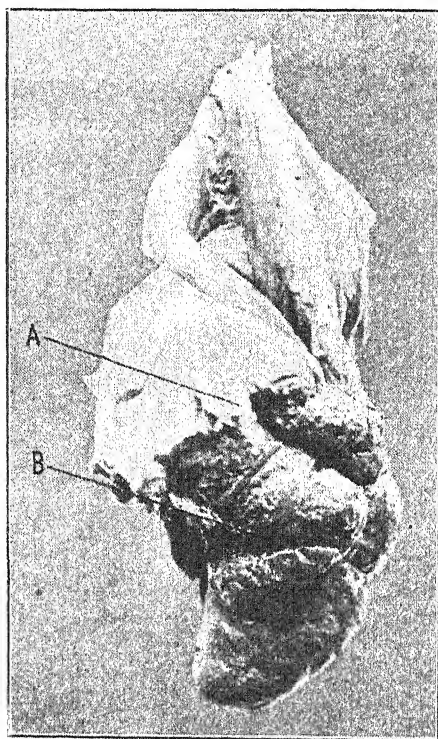
WELSH pony, eight-year-old, working in the mine. Took the ground with colic on the 3rd, and treated with the usual medicines with little or no relief. On arrival I found the pony on his back with his legs flexed at the knees and hocks, and the feet resting upon the abdomen. As he was quiet I left him alone,

and had to wait over an hour before he voluntarily changed his position. He got on to his feet and I examined him.

Membranes quite in order, blowing rather quickly, pulse a bit fast, body warm and comfortable.

Rectal examination revealed large bowel full and the small bowel empty. No straining.

Diagnosed stoppage, and treated accordingly with medicines and enemas. The pony went down immediately after the draught



Invagination of the cecum. A, Edge of large bowel severed to show strangulation and inversion of the "caput" B.

was given, and lay in his favourite position for quite two hours. I left him in this position. Next day, and up to the 7th, the pony lay practically the whole time on the ridge of his back. On the 7th the bowels became relieved and the pony free from pain and standing in a normal manner. He progressed until the 11th when the pain commenced again, and again the pony sought relief by lying on his back; treatment administered being the

same as before. Next day seemed much easier, rectal examination revealed large bowel practically empty. A bloody diarrhoea commenced on the 13th, accompanied by continuous straining; pony weak and blowing hard, mucous membranes injected and pulse quick and hard.

These conditions continued throughout the next day, and he died on the 15th.

Post-mortem.—Complete inversion (and strangulation) of the caput cæcum coli into the lumen of the large bowel.

In the photograph the portion marked A is the edge of the large bowel, which has been severed in order to show the complete inversion and strangulation of the caput marked B.

HYDROCHLORIC ACID POISONING IN HORSES.

BY VETERINARY-SURGEON LEVENS.

Coch.

POISONING by irritant acids appears to occur very rarely in our domesticated animals. As far as the literature is accessible to me, I find only two recorded cases.* In one instance recorded by Gerlach the poisoning was occasioned by feeding on oat straw which had been used as packing for some flasks of sulphuric acid. In the second case, reported by Johne, sulphuric acid also was the poison. It had been added to a mash.

As I had a case of hydrochloric acid poisoning a short time ago in my own horses. I thought particulars would be of general interest if published.

One morning my groom informed me that both my horses were ill and would take no food. He thought it was foot-and-mouth disease, as shreds hung from "Lady's" mouth.

Examination showed the following condition:—

The animal "Lady" stood apathetic before her manger, played with her tongue, and foamed at the mouth. The lips were swollen, bleeding, inflamed, and symmetrically excoriated. The whole oral mucosa was inflamed, and partly denuded of epithelium, which hung in large shreds from the mouth. The taking of food, whether oats, bran, or hay was declined.

* [A case of HCl gas poisoning was recorded by Sturdy in the *Journ. of Comp. Path. and Ther.*, 1908, p. 75, and is quoted by Lander in his "Veterinary Toxicology" recently published by Messrs. Baillière, Tindall & Cox.—Eds., V.J.]

Apparently there was much thirst. On offering a bucketful of water the mare only drank a little, but kept playing in the water persistently with her tongue.

The pulse was small, 80 per minute, and peristalsis was still normal.

The second horse "Bitz" showed slight symptoms of ulcerous stomatitis, but rather those of gastro-enteritis with profuse diarrhoea.

The diagnosis of ulcerous stomatitis with gastro-enteritis was easily established, but the fixing of the cause was more difficult.

A malicious giving of an irritant was excluded, so the cause must have arisen from the food. As rations the horses received foreign oats mixed with locally grown ones, and very good Meuse hay. Here the cause must be sought.

Since the hay was irreproachable, the complaint could only be brought about by the oats.

On the usual examination nothing striking could be noticed. They were white and free from smell. On tasting and chewing them a burning sensation was communicated to the mouth.

In order to have the cause investigated I sent the oats to the local State Chemical Laboratory to be examined.

Drs. Sprinhmeyer and Diedrich reported that the oats contained a large percentage of hydrochloric acid.

The symptoms of poisoning were now easily cleared up.

Since the oats were bad this year and of a dirty dark brown, almost black, colour, they had, for purposes of sale and to give them a better appearance, been scoured in hydrochloric acid, and not sufficiently washed out.

Therapeutically both horses received lukewarm sloppy bran, and sodium bicarb. strewn in the manger, which they eagerly licked up. Water was frequently given them to rinse out their mouths. In the course of three or four days both of them recovered.—*Deutsche tierarzt. Woch.*

Canine Clinical.

PAPILLOMAS OF THE MOUTH.

By R. LEWIS GREEN, M.R.C.V.S.

Dudley.

THE patient was a young bull terrier with a large number of warts on the buccal membrane of the mouth and on the tongue and roof; in fact the whole of the interior was absolutely covered. To have excised them, even a few at a time, would have been a very painful process for the patient, so I decided to try the effect of medicinal treatment, and put the patient on 5 gr. of salicylate of soda three times a day for three weeks. By this time they had almost entirely disappeared, and I then gave full doses of liq. arsenicalis for another ten days, by which time they had completely gone. The cure was permanent.

Abstract.

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(Dated February 13, 1913.)

TUBERCULOSIS ORDER OF 1913.

THE Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1911, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:—

INTERPRETATION.

- 1.—In this Order:—
 - “The Board” means the Board of Agriculture and Fisheries.
 - “Local Authority” means a Local Authority for the purposes of the Act of 1894.
 - “The Act of 1894” means the Diseases of Animals Act, 1894.
 - “Inspector” includes Veterinary Inspector.
 - “Bovine animal” means a bull, cow, ox, heifer or calf.
 - “Cow” includes a heifer that has calved.
 - “Milk” includes cream and separated or skimmed milk.
- Other terms have, where the context so permits, the same meaning and scope as in the Act of 1894.

NOTICE OF DISEASE.

2.—(1) Every person having in his possession or under his charge:—

(i) any cow which is, or appears to be, suffering from tuberculosis of the udder, indurated udder, or other chronic disease of the udder; or

(ii) any bovine animal which is, or appears to be, suffering from tuberculosis with emaciation

shall without avoidable delay give information of the fact to a constable of the police force for the area wherein the animal is, or to an Inspector of the Local Authority, and the constable or Inspector shall transmit the information to the Local Authority, who, if not themselves the Sanitary Authority, shall inform that Authority.

(2) The person in possession or having charge of the animal shall forthwith take such steps as are necessary to secure compliance with Article 9 (*Precautions to be adopted with respect to Milk, &c.*) and Article 10 (*Detention and Isolation of Suspected Animals*).

NOTIFICATION OF DISEASE BY VETERINARY SURGEONS.

3.—(1) A veterinary surgeon or veterinary practitioner who in his private practice is employed to examine any animal, and is of opinion that the animal, if a cow, is suffering from tuberculosis of the udder, indurated udder, or other chronic disease of the udder, or, if a bovine animal, is suffering from tuberculosis with emaciation, shall with all practicable speed give notice of the existence or suspected existence of such disease to an Inspector of the Local Authority, who shall transmit the information to the Local Authority, who, if not themselves the Sanitary Authority, shall inform that Authority.

(2) A veterinary surgeon or veterinary practitioner who under and in accordance with this Article gives notice of the existence or suspected existence of disease to an Inspector of the Local Authority shall be entitled to receive from the Local Authority a fee of two shillings and sixpence for each notification.

(3) Where two or more animals are examined by a veterinary surgeon or veterinary practitioner on the same premises and at the same time and are found to be diseased, one fee only shall be payable to him under this Article in respect of the notification of the existence or suspected existence of disease in such animals.

INSPECTION AND EXAMINATION OF ANIMALS.

4.—(1) Where a Local Authority, by reason of information received under the preceding Articles or otherwise, have reasonable ground for supposing that on any premises in their District there is a cow which is suffering from chronic disease of the udder or giving tuberculous milk, or a bovine animal which is suffering from tuberculosis with emaciation, the Local Authority shall with all practicable speed cause such veterinary examination of the bovine animals on such premises to be made by a Veterinary

Inspector as in the opinion of the Local Authority is necessary to ascertain whether any cow thereon is suffering from tuberculosis of the udder or giving tuberculous milk, or whether any bovine animal thereon is suffering from tuberculosis with emaciation, and for that purpose the Inspector may, with the previous consent in writing of the owner of the animal or of his agent, but not otherwise, apply the tuberculin test to any cow which the Inspector suspects of suffering from tuberculosis of the udder, or of giving tuberculous milk, or to any bovine animal which he suspects of suffering from tuberculosis with emaciation.

(2) For the purpose of such examination, a Veterinary Inspector may at all reasonable hours enter on any part of the premises and examine any bovine animal thereon, and require any cow to be milked in his presence, and may take samples of the milk, and the milk from any particular teat shall if he so require be kept separate, and separate samples thereof shall be furnished.

(3) The Inspector may also take samples of the fæces or urine of any bovine animal on the premises, or of any abnormal discharge from any bovine animal thereon.

(4) The occupier of the premises and the persons in his employment shall render such reasonable assistance to the Inspector as may be required for all or any of the purposes of this Article, and any person refusing such assistance shall be deemed guilty of an offence against the Act of 1894.

(5) The Inspector shall as soon as possible send to the Local Authority a report showing the result of his inspection and examination and of the examination of any sample taken by him. The Local Authority, if not themselves the Sanitary Authority, shall send a copy of the report to that Authority.

(6) If the report of the Inspector as to any animal does not show that it is suffering from tuberculosis of the udder, or giving tuberculous milk or suffering from tuberculosis with emaciation, the Local Authority shall forthwith give notice in writing to the owner or person in charge thereof that the provisions of this Order relating to precautions to be adopted with respect to milk and detention and isolation of suspected animals have ceased to apply to the animal.

SLAUGHTER OF DISEASED ANIMALS.

5.—(1) Where a Local Authority are satisfied by the report of the Inspector that in their District there is a cow which is suffering from tuberculosis of the udder, or giving tuberculous milk, or a bovine animal which is suffering from tuberculosis with emaciation, the Local Authority shall with all practicable speed give notice in writing (in the Form set forth in the Schedule hereto or to the like effect) to the owner or person in charge of the animal and also to the Board, and cause the animal to be slaughtered; provided that if, before the slaughter is carried out, the owner of the animal, or any person on his behalf, gives notice in writing to the Local Authority, or to their Inspector or other officer directed to carry out such slaughter, that the

owner objects to the animal being slaughtered under the provisions of this Order, it shall not be lawful for the Local Authority to cause the animal to be slaughtered without the special authority of the Board first obtained; provided also that this special authority shall not be given in the case of any animal valued under this Order at more than thirty pounds, if and so long as the animal is detained and isolated, and the milk (if any) is dealt with in accordance with the provisions of this Order.

(2) If the value of an animal proposed to be slaughtered, as agreed or certified under this Order, exceeds thirty pounds, the Local Authority shall not proceed with its slaughter unless so directed by the Board.

VALUATION FOR COMPENSATION.

6.—(1) Before the slaughter of an animal the Local Authority shall either agree in writing with the owner of the animal the value thereof in its condition at the time of valuation, or if they shall fail so to agree shall cause such value to be ascertained by a valuer appointed by them or appointed on the application of the Local Authority by the Board, but paid by the Local Authority, and such valuer shall give to the Local Authority and to the owner a certificate in writing of the said value.

(2) In ascertaining the value of an animal, regard shall be had to any Act, Order, or Regulation dealing with the sale or use of milk, milk products, or carcasses for human food.

(3) The value shall be ascertained both on the basis of the certificate of examination hereinafter required showing that the animal was suffering from tuberculosis, and also on the basis of its not showing that the animal was suffering from tuberculosis, and the amount to be paid for compensation shall depend on such certificate accordingly.

POST-MORTEM EXAMINATIONS OF SLAUGHTERED ANIMALS.

7.—(1) In the case of every animal slaughtered under this Order, the Local Authority shall cause the carcass, at the time of slaughter or as soon as practicable thereafter, to be examined by a Veterinary Inspector of the Local Authority, or (if so required by the owner or person in charge of the animal before it is slaughtered) by some other veterinary surgeon, who, failing agreement between the Local Authority and such owner or person, shall be nominated by the Board but paid by the Local Authority.

(2) The Veterinary Inspector or other veterinary surgeon shall at the conclusion of his examination give to the Local Authority and to the owner of the animal a certificate of the result of the examination in the Form set forth in the Schedule hereto or to the like effect.

COMPENSATION.

8.—(1) If the Local Authority fail to carry out the examination required by the preceding Article, or if the certificate of such

examination does not show that the animal was suffering from tuberculosis, the Local Authority shall, by way of compensation, pay to the owner thereof a sum equal to the value of the animal as agreed or certified in manner aforesaid and a further sum of twenty shillings.

(2) If the certificate of the examination shows that the animal was suffering from tuberculosis (not being advanced tuberculosis), the Local Authority shall, by way of compensation, pay to the owner a sum equal to three-fourths of the value of the animal as agreed or certified in manner aforesaid, after deducting from such sum one-half of their reasonable costs of any valuation of the animal by a valuer appointed by the Board, and of any examination of its carcase by a veterinary surgeon other than the Veterinary Inspector.

(3) If the certificate of the examination shows that the animal was suffering from advanced tuberculosis, the Local Authority shall, by way of compensation, pay to the owner a sum equal to one-fourth of the value of the animal, as agreed or certified in manner aforesaid or the sum of thirty shillings, whichever sum is the greater, after deducting from such sum one-half of their costs of valuation and examination as in the preceding case.

(4) For the purposes of this Order an animal slaughtered under this Order shall be deemed to have been suffering from advanced tuberculosis

(a) When there is miliary tuberculosis of both lungs;

(b) when tuberculous lesions are present on the pleura and peritoneum;

(c) when tuberculous lesions are present in the muscular system, or in the lymphatic glands embedded in or between the muscles; or

(d) when the carcase is emaciated and tuberculous lesions are present.

PRECAUTIONS TO BE ADOPTED WITH RESPECT TO MILK, &c.

9.—(1) The milk produced by any cow which is, or appears to be, suffering from chronic disease of the udder or tuberculosis with emaciation, shall not be mixed with other milk until the cow has been examined by a Veterinary Inspector in accordance with the provision of this Order, and until the owner or person in charge thereof has been notified that this Article has ceased to apply to the cow: and all milk affected by this Article shall forthwith be boiled or otherwise sterilized, and any utensil in which such milk is placed before being so treated shall be thoroughly cleansed with boiling water before any other milk is placed therein.

(2) A Local Authority, or a Veterinary Inspector on their behalf, may by written notice apply the restrictions imposed by this Article to the milk produced by any cow specified in the notice which is suspected of giving tuberculous milk and is being examined under this Order, and such restrictions shall apply accordingly.

DETENTION AND ISOLATION OF SUSPECTED ANIMALS.

10.—(1) Every person having in his possession or under his charge any cow which is, or appears to be, suffering from chronic disease of the udder, or any bovine animal which is, or appears to be, suffering from tuberculosis with emaciation, shall keep the animal isolated as far as practicable from other bovine animals and also keep the animal in his possession or under his charge, until the animal has been examined by a Veterinary Inspector in accordance with the provisions of this Order and the owner or person in charge thereof has been notified that this Article has ceased to apply to the animal; provided that the animal may at any time be slaughtered by the owner or person in charge.

(2) A Local Authority, or a Veterinary Inspector on their behalf, may by written notice apply this Article to any bovine animal specified in the notice which is being examined under this Order, and such Article shall apply accordingly.

SUSPECTED ANIMALS IN MARKETS, FAIRS, AND SALES.

11.—(1) A Veterinary Inspector of a Local Authority may by notice served on the owner or person in charge of a bovine animal exposed in a market, fairground, or saleyard which appears to him to be

(i) suffering from tuberculosis of the udder, indurated udder, or other chronic disease of the udder; or

(ii) suffering from tuberculosis with emaciation, require the animal to be removed from the market, fairground, or saleyard to the premises from which it was brought thereto, or if the owner or person in charge so desires, to any other suitable premises, to be specified in the notice, and thereupon the animal shall forthwith be moved by the owner or person in charge to those premises for the purpose of examination under the foregoing provisions of this Order.

(2) Where the premises to which the animal is required under this Article to be moved are not in the same District as the market, fairground, or saleyard, the Inspector serving the notice shall forthwith send a copy of the notice to the Local Authority of the District in which the first-mentioned premises are situate.

CLEANSING AND DISINFECTION.

12. The occupier of any premises on which there has been a cow suffering from tuberculosis of the udder or giving tuberculous milk, or a bovine animal suffering from tuberculosis with emaciation, shall if so required in writing by an Inspector of the Local Authority cleanse and disinfect at his own expense, and to the satisfaction of the Inspector, that part of any shed or other erection in which the animal has recently been placed or kept.

REPORTS TO THE BOARD.

13. Every Local Authority and their Inspectors and officers shall send and give to the Board such reports, returns, and

information as to their proceedings under this Order as the Board require.

EXTENSION OF CERTAIN SECTIONS OF DISEASES OF ANIMALS ACT,
1894.

14. Tuberculosis shall be a disease for the purposes of the following sections of the Act of 1894 (namely):—

Sections nineteen and twenty (*Slaughter in Disease and Compensation Generally*);

Section forty-three (*Police*);

Section forty-four (*General Administrative Provisions*);

and also for the purposes of all other sections of the said Act containing provisions relative to or consequent on the provisions of those sections and this Order, including such sections as relate to offences and legal proceedings.

INFORMATION TO BE GIVEN AS TO CERTAIN ANIMALS OR ANIMALS IN
CONTACT THEREWITH.

15. Article 36 of the Animals (Transit and General) Order of 1912 (*Information to be given as to Diseased or Suspected Animals or Animals in contact therewith*) shall apply to

(i) any cow which is, or is suspected of, suffering from tuberculosis of the udder or giving tuberculous milk; and

(ii) any bovine animal which is, or is suspected of, suffering from tuberculosis with emaciation.

OFFENCES.

16. Every person who—

(i) fails to give the notice required by Article 2 or Article 3 of this Order; or

(ii) fails to comply with any provision of this Order relating to precautions to be adopted with respect to milk or relating to detention and isolation of animals; or

(iii) fails to comply with any notice directing removal of an animal from a market, fairground or saleyard; or

(iv) fails to cleanse or disinfect any erection which under this Order he is required to cleanse or disinfect

shall, according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

EXTENT.

17. This Order extends to England and Wales and Scotland.

LOCAL AUTHORITY TO ENFORCE ORDER.

18. The provisions of this Order, except where it is otherwise provided, shall be executed and enforced by the Local Authority.

COMMENCEMENT.

19. This Order shall come into operation on the first day of May, nineteen hundred and thirteen.

SHORT TITLE.

20. This Order may be cited as the TUBERCULOSIS ORDER OF 1913.

In witness whereof the Board of Agriculture and Fisheries have hereunto set their Official Seal this thirteenth day of February, nineteen hundred and thirteen.

SYDNEY OLIVIER,
Secretary.

Translation.

TREATMENT OF TETANUS BY SULPHATE OF MAGNESIA, BY CARBOLIC ACID, AND BY ANTI-TETANIC SERUM.*

EACH series of experiments was tried on dogs that had been subjected to the same amount of toxin relative to their size at the same time.

Sulphate of magnesia was injected into the cephalo-rachidian fluid between the atlas and the occiput in the proportion of $1\frac{1}{2}$ mg. to each pound of the animal's weight.

This drug was found to diminish the convulsive contractions and excitability, but it had no effect on the toxic evolution, whatever the dose and whenever it was administered.

Carbolic acid (subcutaneously injected) is not more efficacious, it has no effect on toxin that has (quite or almost) taken hold of the nervous centres. Its employment is not attended by any untoward consequences, at least not in the usual doses of $\frac{1}{4}$ c.c. of a 3 per cent. solution to each pound of the animal's weight. This cannot be said of sulphate of magnesia, which can occasion serious accidents. Far better results than those of the preceding methods were obtained by anti-tetanic serum injected simultaneously into the cephalo-rachidian fluid, in the veins, and under the skin.

The author also experimented with peptonized anti-tetanic serum, and found that its immunizing action was not in any way reduced by this pre-digestion, which serves to separate the albuminoids and by reducing the volume of the anti-tetanic serum permits a more rapid diffusion and a more immediate action on the toxin. Up to the present the results obtained have been irregular, but the anti-tetanic serum of treatment appears to be the most practical.

* As reported to the Biological Society of France by J. Casnús.



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The cover is fixed on the cylinder with a bayonet-fastening; for the purpose of thorough cleaning it is provided with a segmental incision, by means of which it can be detached from the piston-rod by sliding it off side-ways. When completely taken apart the Record Syringe forms 3 parts only: cover, piston and barrel.

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The fixing of the needle itself in the mount, by means of a smooth longitudinal guide arranged above the screw threads prevents the needle from breaking off in the mount.

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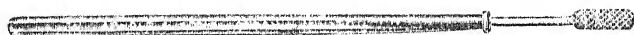
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WOUND-DRESSING INSTRUMENT.

As recommended by Major W. A. PALLIN, A.V.C.

To the Editor of THE VETERINARY JOURNAL.

SIR,—With the advent of the iodine treatment for wounds, the want of some small instrument for applying the same must have been felt by those who adopt this method of treatment.



The above is a sketch of a wound-dressing instrument, made for me to my own design, and I should be very much obliged if you would bring it to the notice of the profession through the medium of your valuable journal.

A small piece of cotton-wool or tow is wrapped round the roughened end of the instrument, and a tincture of iodine is applied thereby.

The instrument is manufactured by Arnold and Sons, London; I consider it meets a daily want in veterinary surgery and will enable practitioners to adopt the iodine treatment in a neat and aseptic manner.

Yours faithfully,

Harismith, South Africa.

W. A. PALLIN.

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

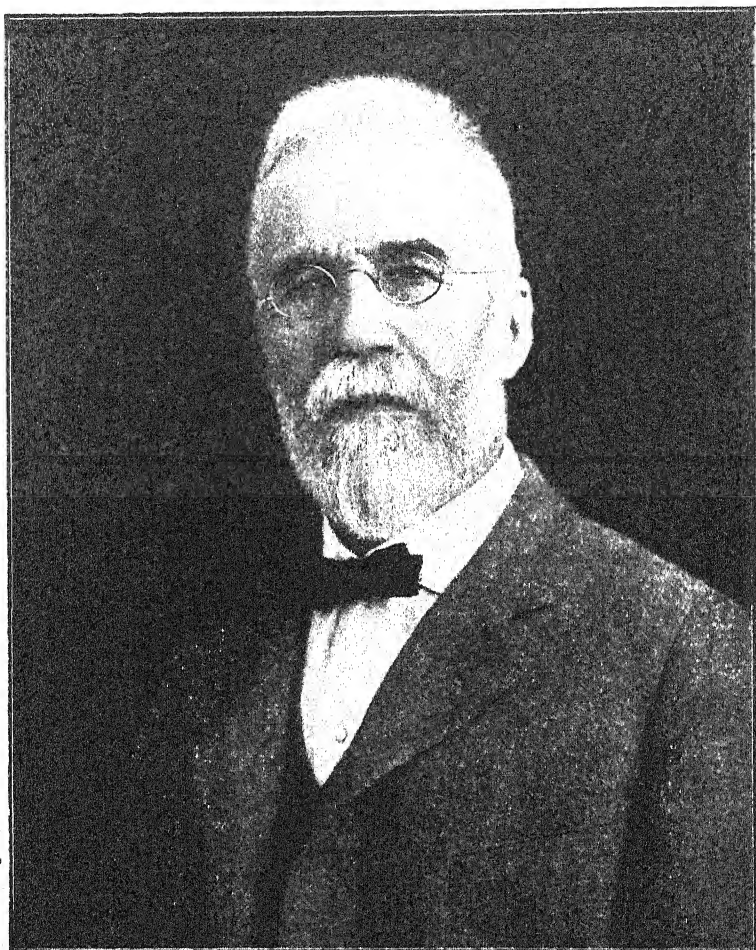
NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.



A handwritten signature in cursive script, reading "Lachlan McLean". The signature is written in dark ink and features a long, sweeping underline that extends to the right.

MR. LACHLAN McLEAN, M.R.C.V.S.

One of the Founders (and formerly President) of the American Veterinary
Medical Association.

THE VETERINARY JOURNAL

MAY, 1913.

Editorial.

THE ANIMALS (ANÆSTHETICS) BILL.

THE Animals (Anæsthetics) Bill brought before Parliament last year by Mr. Walter Guinness was withdrawn. It had the appearance of having been drawn up somewhat hurriedly and without full consideration of the operations for which general anæsthetics were to be made compulsory. For example, it was sought to enforce the use of a general anæsthetic for the extraction of molar teeth in horses, whereas most of us are aware that to comply with that would have been to expose the horse to grave risk of death from choking with blood, or to pneumonia as the result of the aspiration of blood into the lungs during the operation. On the other hand, the extraction of a molar tooth is by far the most frequently required in old horses, the casting of which would be fraught with danger to the back, while in such cases it is frequently a very easy matter to extract the offending molar in the standing position. Veterinary surgeons, although desirous of using anæsthetics in all painful operations, were unable to support the Bill on account of such items, while agriculturists found that the Bill would inflict great and unnecessary hardships on them, and it is certain that the Bill could not possibly have passed in its original form.

Consequently, it has been amended in very important particulars, and has again been presented to Parliament and read the first time. It is reproduced on pp. 244-5 of this Journal. In its

new form we welcome it, and if it becomes law we are sure that its provisions will be very heartily carried out by the veterinary profession. We know full well that all the operations named in the three schedules and others besides would almost invariably be performed under anæsthesia if the veterinary surgeon were able to please himself. Unfortunately, however, the owner of the patient frequently refuses to pay for it, and as the veterinary surgeon is dependent upon fees for his livelihood he cannot afford the additional time and expenditure without compensation. He has consequently either to perform the operation without the anæsthetic, or by refusing allow it to be done, with the probable infliction of greater pain, by a quack, and run the risk of offending and losing a client.

There would appear also to be every prospect of agriculturists being satisfied by the Bill in its new form, for we believe that the Animals' Diseases Committee of the Central Chamber of Agriculture have considered the matter, and have no objection to it. Moreover, we note that it has been backed amongst others by Mr. Courthope, an ex-Chairman of the Central Chamber of Agriculture. An important alteration has been made in reference to the castration of colts, and the Bill does not ask for an anæsthetic for castrating horses under 2 years old. This is a concession to a very widely held opinion, and will permit the continuance of the practice of castrating colts standing. On the true humanitarian aspect such a concession should not have been made, but it is certainly better policy to make it than to risk the loss of the Bill as a whole. The word "radical" has been prefixed to operations for quittor, and poll-evil, and this we consider a great improvement. Without it any operation for quittor, such as the insertion of caustic plugs, would have necessitated a general anæsthetic, an obvious absurdity.

There are several additions to the schedules, however, which might be made with advantage. We consider that in horses the stripping of the wall of the hoof, or a part of it, should necessitate the use of an anæsthetic, as well as stripping of the sole. A general anæsthetic should be prescribed for any operation involving laparotomy in any animal, while the excision of tumours should always be done under the influence of an anæsthetic either local or general.

There is no reference to the vexed question of docking. In

our opinion the practice of chopping off portions of the tails of certain breeds of dogs and of horses, with the possible exception of hackneys and light trappers, is absolutely indefensible as a routine practice. There are certain occasions when it must certainly be done, and when it is necessary it should be done under the influence of either an anæsthetic or a narcotic.

The compulsory use of a general anæsthetic, however, for any scheduled list of operations is inadvisable unless a clause is inserted allowing the veterinary surgeon to use his discretion in certain physical conditions of the patient. There are numerous instances where it would be dangerous to the life of the animal either to cast for an anæsthetic or to administer an anæsthetic. A clause should therefore be added to allow a veterinary surgeon to use his discretion in those cases where the administration of a general anæsthetic would be dangerous or prejudicial to the life of the patient, as, for example, the casting of an aged horse with an ankylosed spine, for firing, or other purposes. It is possible, however, that chloral hydrate, as permitted by the Bill, may be used with safety in such cases.

On the whole, then, we hope that the Bill will become law, for it will reduce the sum total of pain and suffering on the part of our four-footed friends.

IN AID OF THE VICTORIA VETERINARY BENEVOLENT FUND.

AN amateur performance of the domestic drama, "Sweet Lavender," by Arthur W. Pinero, will be given at the Town Hall, Maidenhead, on Wednesday, May 7, and Thursday, May 8, 1913. Doors open each evening at 7.30, commence at 8 p.m. Carriages at 10.15 p.m. Matinée on Thursday, 2.30 p.m. Doors open at 2. Carriages 4.45. Reserved seats, 3s., 2s., and 1s., may be booked at Messrs. Dyson and Sons' Music Establishment, High Street, Maidenhead.

Any offers of help in the disposal of tickets will be gratefully received by Percy J. Simpson, F.R.C.V.S., Maidenhead, who will also be pleased to book seats on receipt of cheque or postal order for the number of tickets required.

			P.M.	P.M.	P.M.	P.M.
Trains depart	Paddington	...	...	12.33	1.50	6.30
" arrive	Maidenhead	...	...	1.28	2.26	7.3
" depart	Maidenhead	...	...	4.40	6.2	10.16
" arrive	Paddington	...	...	5.14	6.38	11.47
						11.50

General Articles.

MEMBERS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS WHO HAVE BEEN MAKERS OF AMERICAN VETERINARY HISTORY.—A POSTSCRIPT.

BY D. ARTHUR HUGHES.

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A YEAR ago the author, as the reader knows, wrote a series of articles for THE VETERINARY JOURNAL on some members of the Royal College of Veterinary Surgeons who have achieved national distinction in comparative medicine in the United States of America. If he had not been afraid of running the chance of wearying the reader by dwelling too long on *biographia veterinaria*, because of prolixity, much more might have been written upon other noble names. That would be a country not far advanced in knowledge of modern medicine which did not have in its midst men successful in the application of the principles of veterinary science to the needs of its domesticated animals, or devotees of some forms of veterinary thought or work. Wherever veterinary medicine is to be successfully taught, or successfully practised, there members of the Royal College of Veterinary Surgeons are to be found. Where relief is to be brought to suffering dumb creation; where there is a demand for picked scholars to engage at important posts in the teaching of veterinary science as "makers of men," to use the fine phrase of the Liverpool poet, William Watson, at such times Royal College men have not been found wanting. It would appear that the British training of veterinarians smacks of the ideal of the Clerk of Oxenford epitomized in the prologue of Chaucer's "Canterbury Tales," and inculcates this doctrine of the proper attitude of each scholar to the other: "And gladly wolde he lerne, and gladly teche." In pointing out the achievements of some British-trained men in the United States the object was not to disparage the work of similar men in other countries. What Professor O. Charnock Bradley said for the Royal (Dick) Veterinary College, Edinburgh, when he spoke of the renowned men in Great Britain who had come from that College, probably might be said for other veterinary colleges in Great Britain. Similarly

what was said of some of the members of the Royal College in America might also be said of other countries in the Anglo-Saxon world.

If the present writer may be pardoned for the statement, he would here express his thanks for the many commendations on his articles, coming from many quarters of the globe. They happily were, apparently, well received everywhere where they were read. The main objection seems to have been that many more men might have been mentioned than those whose names appeared. But every piece of work of mortal man must have its limitations, and every series of articles must have its confines. We were speaking of representative members of the Royal College of Veterinary Surgeons who have been makers of American veterinary history. It is possible by much speaking to run to the very fringe of boredom, and, by delivering oneself up to turgidity, to try even the man with Job's patience. But every piece of good work is self-justified. If the series written was beneficial, that carries with it its own satisfaction. For biographical writing is an inspiration, and its aroma permeates the printed page. To him who falters in his ambitions the advice to be given is: Read the lives of great men who sacrificed much in the temple of truth. The loftiness of their work; the ardour with which they pursued their ambitions; their abandon to the subject of their devotion, will fire anew the laggard and dissipate unworthy purposes. Several years ago a noted American publishing house printed a book under the caption "Makers of Biology," in which were inscribed the deeds of celebrated biologists. It seems to me that the makers of veterinary science in all countries who have contributed to the foundations of our profession as investigators, clinicians or teachers, are worthy of similar encomium; not in fulsome or empty phrases, rather in terms of truth should their merits be spread upon our records for the stimulation of men in our day and those who come after us.

When the last series of biographical sketches was running in *THE VETERINARY JOURNAL* the Editor was good enough, in mentioning the articles, to refer to the benefits which would accrue to those who took post-graduate study after receiving membership in the Royal College. In very truth the rewards of such study are great. Highly successful men are those who

have not confined their student days to those before they acquired the rights of membership in the profession; but those whose whole life has been a toil upward, and still upward to the light. The broadening of the intellectual vision, referred to by the Editor, by occupation in post-graduate studies, is something devoutly to be striven for. The degree of success won by those who did have the benefits of post-graduate study only suggests a greater success to be obtained from that study. It is something which has been in operation at the University of Giessen in Germany and the University of Berne in Switzerland, where the degree of Doctor of Veterinary Medicine could be obtained, and was obtained by a few, after higher studies in veterinary science, the writing of a thesis and its defence, and the doctorate examinations before the University faculty. And this has, by decree of Emperor William, been recently inaugurated in the State veterinary schools of Prussia. In standing for post-graduate studies in veterinary science the Editor was not only true to his convictions, but true to the natural order of things. The increase of a man's knowledge means the increase of his usefulness, which is something for which all are striving. Studies of the careers of successful veterinarians in every instance emphasize the fact. They may not have had post-graduate studies *in cursu*; nevertheless their lives show that their success was due to their zealous and passionate intellectual labour, which became more ardent with the years, and that a better preparation for the turmoil would have increased their scope and grasp of veterinary problems. Men too frequently do not arrive on the higher planes of intellectual endeavour on account of inadequacy of training. "Wisdom is justified in her children," because the product is the outcome of fulness of knowledge obtained beforehand. For, as Robert Browning says in "A Grammarian's Funeral":—

" Oh, if we draw a circle premature,
Heedless of far gain;
Greedy for quick returns of profit, sure
Bad is our bargain."

Such tenets as this, which is the dictum of one of the greatest of the Victorian writers, which contains the increments of success, are borne out in the acts of the luminaries of our profession and in the results of their work. Any group of distinguished veter-

inarians in any country illustrates the truths propounded. Students of the higher learning in a direct or an indirect way, in post-graduate studies or otherwise, exemplify the doctrine that too engrossing an anxiety for immediate financial profit blinds the eyes to the greater gains to be had from closer application to deeper studies. It is to be seen in the career of the man I am desirous of mentioning in this article—a man whom numerous persons, on both sides of the Atlantic, have besought me to make the subject of a special article, I refer to Lachlan McLean, M.R.C.V.S., of Brooklyn, New York.

LACHLAN McLEAN, M.R.C.V.S.

In September of this year the American Veterinary Medical Association will celebrate the fiftieth anniversary of its existence. Originally organized in the city of New York, it returns to New York for the celebration. Of two things the American Veterinarian with progressive leanings is proud: (a) the birth and steady growth of the American Veterinary Medical Association, now fast approaching a membership of two thousand men, with its wholesome influence on veterinary education and veterinary tendencies, and (b) the establishment of the Bureau of Animal Industry, United States Department of Agriculture, and the expansion of its power. It is to Mr. McLean's credit that he had a strong hand in both. This venerable gentleman, who, if he lives until January 22, 1913,* will be eighty-three years old, and is still in active practice, has given a long life to professional advance in the United States as an educator, a sanitarian, and as a clinician. He belongs to that group of renowned New York veterinarians who inaugurated collegiate veterinary training in this country, who paved the way for the establishment of the present national control of animal infections, and who built up a large practice in the heyday of the horse in rich cosmopolitan New York. He associated himself with Dr. Liautard, became a member of the first veterinary medical faculty in New York, and was one of the early presidents of what was the precursor of the American Veterinary Medical Association. His work as a diagnostician in determining the presence of pleuro-pneumonia in cattle in 1879 argued for the need of a National Bureau for the control of animal infections.

* [This article was written for the January issue, but was unavoidably held over until the present one.—ED. V.]

Lachlan McLean was born in Inverness, Scotland, in 1832, the son of Roderick and Marjorie (Patterson) McLean. He graduated at the Royal Veterinary College, Edinburgh, in 1854, and received membership in the Royal College of Veterinary Surgeons. For a time he practised in his native county, and was appointed Government Veterinary Inspector in Inverness. Although very successful in Scotland, he sought greater opportunities by emigrating to the United States in 1875. He settled in Brooklyn, New York, and has made his home there ever since. In October, 1878, McLean was appointed Veterinary Inspector for the Brooklyn Board of Health, the first official veterinary appointment connected with a Board of Health in America. He was also the first Professor of Bovine Pathology in America, holding the position for six years in the first veterinary school established by Dr. Liautard in New York. Later he was veterinary expert for the national Government in New Mexico and the western States.

But his most important work, according to a sketch of McLean's life in the "History of Long Island," which made him at the time a national figure, was the detection of the presence of contagious bovine pleuro-pneumonia in the United States and its demonstration beyond cavil. He was the first—January, 1879, through the local Board of Health of Brooklyn—to draw the attention of Governor Robertson, of New York, to the presence of the disease on Long Island. His diagnosis was disputed; but, after several *post-mortems* on suspected animals, his judgment was sustained. Under his inspection, under the direction of General Patrick, who was appointed by the Governor, several thousands of animals were slaughtered. Thus he was enabled to effectually stamp out the disease from that section of New York eight years before the United States Government took hold of the total suppression of the disease under the leadership of Dr. James Law, beginning at the Union Stock Yards, Chicago, Illinois. Dr. McEachran, formerly head of the Veterinary Department of McGill University, Montreal, gives credit to McLean for this work, and, as cited in Walley's "Four Bovine Scourges," quotes letters from him in which the true diagnosis is set forth and request made that the Washington authorities should be incited to take the matter of extirpation in hand. The work of McLean in this matter was the harbinger of a better day for live-stock work; as, in 1887, the United States Government

took the matter up in earnest and the disease was stamped out, never, it is to be hoped, to return. The records of the United States Department of Agriculture show that the presence of contagious pleuro-pneumonia in the United States, and the alarm that it caused amongst cattle-men, was the immediate forerunner of the foundation of the United States Bureau of Animal Industry in 1884. The work that McLean did as a diagnostician of the disease in 1879, therefore, honourably links his name in the chain of events which led up to the establishment. This was of the greatest import to American veterinary affairs, for the United States Bureau of Animal Industry has since developed so extraordinarily as to-day to be considered one of the most valuable departments of the American Government.

There are not many of the early presidents, like Liautard and McLean, of what is now the American Veterinary Medical Association still living. Yet those who remain should be the recipients of the greater honours in the celebration of the fiftieth anniversary of the Association in New York City next September. The event should be of more than passing interest to English-speaking veterinarians all around the world. Members of the Royal College of Veterinary Surgeons have been makers of American veterinary history, and such an one is Lachlan McLean. International comity amongst veterinarians, under these circumstances, especially amongst veterinarians of the highest type such as those referred to in this article, calls for a recognition of international obligations. To the Royal College of Veterinary Surgeons we owe much, and we hope, like a daughter with true filial regard for her mother, to receive all that belongs to a parental blessing from our co-labourers of the Motherland when we enter upon our celebration. The pleasure which we had in extending to Professor Hobday the courtesies of the National veterinary body when he visited us in Toronto a year and a half ago will be more than matched should distinguished British veterinarians visit our shores next September. The International Veterinary Congress is to meet in London in 1914. Here surely is an occasion for felicitous reciprocity. All America looked with satisfaction upon that delicate sense of gentility, that national cordiality, that finesse exhibited by the British Government when full military and naval honours were paid to the memory of the United States Ambassador to the Court of St. James's, Whitelaw Reid, in his recent death. To us, the living, this is but a symbol of that

amity, that unity, that racial harmony, which should and does prevail in the two nations, which are one people. The tie that binds us in unity, peace, and concord, to use the words of the Litany of the Church of England, should embrace veterinarians in the British Isles and America. There might with profit be more commingling of members of the profession from one side of the Atlantic to the other. Travel is an antidote for insularity on the one hand, and for braggadocio on the other. The man with the tincture of cosmopolitanism is usually the man with worldly wisdom. If we are willing to meet you at Charing Cross or Euston Stations, London, you should be willing to walk with us on Broadway, New York. It is all one with us that you were bred on the eastern and we on the western side of the ocean. Blood is thicker than water, and you are our kith and kin. The obligation of each to each has best been expressed in the words of the uncrowned laureate of Greater England:—

“Those that have stayed at thy knees, Mother, go call them in—
We that were bred overseas wait and would speak with our kin.
Not in the dark do we fight, haggle, and flout and jibe;
Selling our love for a price, waning our hearts for a bribe.
Gifts have we only to-day—Love without promise or fee—
Hear, for thy children speak, from the uttermost parts of the
 sea!”

SOME OBSERVATIONS ON THE DIFFERENT STRAINS OF BOVINE PLASMOSES IN SOUTH AFRICA AND THE IMMUNITY CONFERRED BY THEM IN SOUTHERN RHODESIA.

BY LL. E. W. BEVAN, M.R.C.V.S.

Government Veterinary Bacteriologist, Southern Rhodesia.

DURING the year 1911, forty-eight animals, chiefly bulls of the Sussex, Hereford, Shorthorn, and Aberdeen-Angus varieties, were inoculated at Latombo Camp against the bovine plasmoses with virus supplied by Dr. Theiler's Laboratory, which contained the parasite of redwater—*Bacillus bigeminum*—and that known as *Anaplasma centrale*, which was held to confer immunity against *A. marginale*—the causal organism of gall-sickness.

The following table shows the fate of thirty-eight of these

animals since delivery to farmers residing in various parts of Southern Rhodesia:—

ANIMALS FROM GREAT BRITAIN INOCULATED WITH PRETORIA VIRUS AT
LATOMBO CAMP DURING JULY TO NOVEMBER, 1911.

Total inoculated	Reports received	At Camp	DEATHS Since distribution	Relapses with recovery
48	38	Nil.	11	8

ANIMALS FROM GREAT BRITAIN INOCULATED WITH PRETORIA AND LATER WITH
LOCAL VIRUS AT LATOMBO CAMP DURING JULY TO NOVEMBER, 1911.

Total inoculated	Reports received	At Camp	DEATHS Since distribution	Relapses with recovery
10	5	2	Nil.	Nil.

The above figures would indicate that the Pretoria virus does not render the animal completely immune against natural infection in Rhodesia.

This was to some extent foreseen, inasmuch as Dr. Theiler had previously found that "a recovery from infection with *A. centrale* does not cause complete immunity. Moreover, it has been shown not only in South Africa but in other parts of the world that the virulence of these micro-organisms and immunity to them may vary in different districts.

It remained, therefore, to determine whether the virus from the animal from Onderstepoorte Laboratory had died out; whether it had lost its power of conferring immunity; whether it conferred immunity against local strains of virus; whether it was not desirable to fortify animals immunized with this virus against a polyvalent strain before submitting them to natural infection; and whether the breakdown of immunized animals was due to infection with *A. marginale* alone or other complicating causes.

Although cattle from Great Britain inoculated with Pretoria virus in July to November, 1911, showed marked reactions, it was found that the virus had become markedly attenuated if not inert.

During the past year several consignments of cattle, having been received from the Union Provinces of South Africa, received viruses of different origin, and reacted in different ways, as may be seen from the accompanying table (p. 210).

These results are interesting and of local importance inasmuch as it would indicate that the term "non-redwater-veld" is somewhat misleading.

Disappointing results have attended the use of *trypan-blue* which, while controlling redwater, appears to produce a condition unfavourable to recovery from the anaplasmosis which follows. It is especially harmful in pregnant animals.

COMPARATIVE ANATOMY OF SUPERNUMERARY
DIGITS IN CERTAIN UNGULATES AS EVIDENCE
OF THE INTER-RELATIONSHIP EXISTING BE-
TWEEN THE VARIOUS SPECIES.

By J. SHARE-JONES, F.R.C.V.S., M.Sc.

University of Liverpool.

THIRD ARTICLE.*

CASE V.

In the following case the specimen was the manus of a medium-sized pig. It belonged to the left limb. In general appearance the manus was much deformed, for there was a considerable bend at the metacarpo-phalangeal joint. There were, however, three perfectly formed digits, each clothed by a separate fold of the integument from the proximal end of the first phalanx downwards. All three digits reached the ground and were weight-bearing.

The Tendons.—The skin having been removed, the tendon of the extensor communis digitorum was found to split into three portions, and each was attached to the terminal phalanx of one of the three digits. A proper extensor tendon was attached to each of the external digits, but the middle digit had no such tendon.

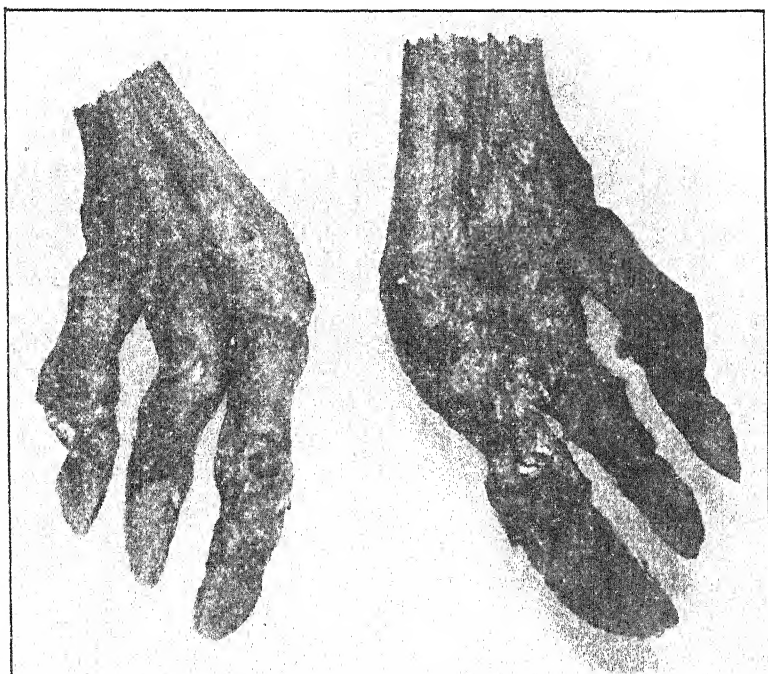
Similarly there were three divisions of the tendons of the superficial and deep flexors, and each of these had the usual insertion.

The Bones.—The most external of the three metacarpal bones (Case V, Fig. II, 1) was much the best developed. Its superior extremity extended to a higher level. The distal epiphyses of all three metacarpals were somewhat six-sided, and the lines of demarcation between them and the diaphyses were still distinctly marked. Their inferior surfaces were curved.

There was nothing remarkable about the first phalanges of

* The first and second articles of this series were published in *THE VETERINARY JOURNAL* for March, 1911, and June, 1911, respectively.

the two outermost digits, but in the case of the innermost digit, although the line of division between the first and second phalanges (Case V, Fig. II, 4 and 5) was well marked on the exterior, both phalanges were firmly ossified, so that the first inter-phalangeal joint in this digit was completely obliterated for some reason for which it appears difficult to offer an explanation. Ossification appeared to be the more complete on the posterior aspect of the bones where the line of division between them was much less apparent. The portion representing the first phalanx



A. Anterior aspect.

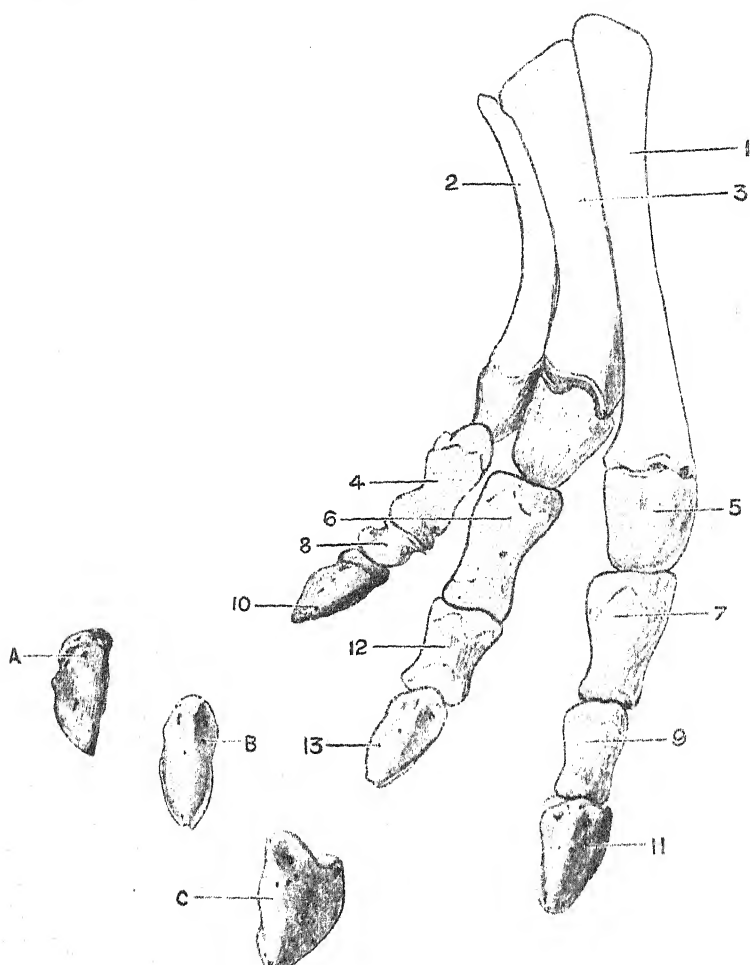
B. Posterior aspect.

Photographs of Specimens in Case V.

was large and well-formed, its outline being very symmetrical, more so in front than was that of the corresponding bones of the external digit. The second phalanx was much less symmetrical, being rather distorted (Case V, Fig. II, 8). It showed on its postero-internal corner a downwardly projecting nodule, which slightly overlapped the face of the terminal phalanx.

Two sesamoid bones only were found. One of these, which was much the larger, was articulated to the back of the distal

extremity of the large metacarpal bone of the middle digit. Anteriorly it presented a slightly concave articular facet. Two lateral surfaces, an apex and a base, could also be distinguished. Although the edges separating these surfaces were rounded and



CASE V.

FIG. XIII.—*The Bones, anterior aspect*: 1, 2, and 3, large metacarpals; 4, 6, and 7, first phalanges; 8, 9, and 12, second phalanges; 10, 11, and 13, third phalanges. A, terminal phalanx of internal digit; B, terminal phalanx of middle digit; C, terminal phalanx of external digit.

to a certain degree ill-defined, we have here a marked resemblance to one of the corresponding bones in the horse. The other sesamoid bone was about half the size and in the form of a rounded nodule.

The Terminal Phalanges (Case V, Fig. II, 10, 11 and 13).—These presented several very interesting features. All three were well-developed, those of the external and internal digits being very similar. The excentric surface of each of the two latter was convex, and in addition to other smaller foramina there was present a foramen in the position of the pre-plantar foramen of the horse, which was, however, placed nearer the elevation in the position of the pyramidal process. The other lateral surfaces were somewhat flattened, and on each there was present a foramen corresponding to the plantar foramen. The inferior surface was slightly concave and calls for no further remark. The excentric border of this surface was very sharp and convex, and each bone was very pointed at the toe.

On examining the corresponding bone in the central digit (13) it was found to be quite symmetrical, so that a sagittal section would divide it into two equal and similar halves. Both lateral surfaces were convex and blended at the front of the bone, and the appearance presented was not unlike that of the laminal aspect of the pedal bone in the horse, excepting that osseous laminae were absent. Superiorly, the surface was raised into a prominent pyramidal process, on either side of which was a large pre-plantar foramen. The inferior surface was slightly concave, and postero-externally possessed a projection which extended upwards on to the posterior aspect of the distal extremity of the second phalanx. Two plantar foramina were present on this surface. It will thus be seen that this bone possessed many important characters which gave it the appearance and structure of a miniature distal phalanx in the horse.

The peculiar features enumerated above possessed by each of the three digits, particularly so far as the other bones are concerned, render it difficult to determine definitely which was the abnormal digit, but if observations were confined to the terminal phalanges, then there would be no hesitation in concluding that such was the central.

CASE VI.

This is the pes of a foal with an external accessory digit. It belonged to the right limb.

On examining the specimen, the first point which attracted attention was the presence of an accessory hoof placed on the outer side of the region of the first phalanx. The metatarsus

was much shorter than normal, and on passing the hand down the limb there was found an enlargement on the outer side of the metatarso-phalangeal joint, which was hard to the touch, and which, but for the presence of the hoof referred to, might readily have been mistaken for one of the exostoses so commonly encountered in this portion. A deep vertical groove, however, could be traced over the front of the joint about an inch to the outer side of the median line.

This specimen differs from those previously described, inasmuch as both digits were enveloped in one fold of the integument from which the accessory hoof appeared as a kind of projection after the manner of the so-called "chestnut." On manipulation it was found to be firmly adherent and, unlike the chestnut, could not be moved about with the skin, showing that it was connected with more deeply-seated structures. On dissection this was found to be the case.

The posterior aspect of the metatarsal region was almost flat. The middle third of this portion was narrowed down very perceptibly, whilst the inferior third became broadened out again, and was almost double the width of the upper extremity. A careful examination failed to reveal any lines of demarcation between large and small metatarsal bones. The marked prominence at the back of the metatarso-phalangeal articulation observed in the normal limb was absent, and this area was almost flat. There was, however, a slight nodular enlargement placed a little to the inner side of the median line. Below the joint we had the first external indication of division into digits, for the point of a finger could be readily passed into a fossa in the integument slightly to the outer side of the median line.

The Hoofs.—The principal hoof was well formed and quite symmetrical. The wall was markedly convex in the transverse direction, and slightly also from above to below. The frog was large and well-defined. Its apex extended to an unusual distance into the sole. There was no evidence of wear.

The accessory hoof was almost symmetrical, its outer half being slightly larger than the inner. The outer heel was very prominent. The inner was attached to the skin on the outer aspect of the first phalanx of the main digit. The frog was well developed but slightly twisted.

Deep cutigeral grooves were present in both hoofs.

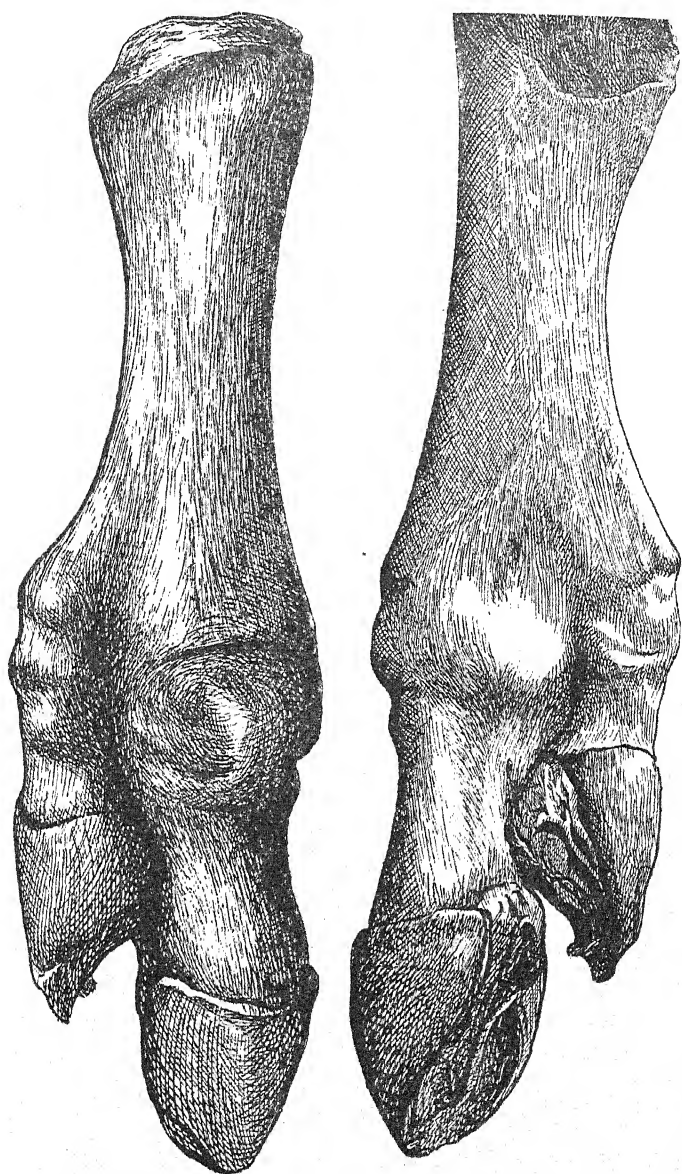


FIG. XIV.—Anterior aspect.

FIG. XV.—Posterior aspect.

Illustration of Case VI.

The Bones.—An examination of the bones revealed several very interesting points.

The Metatarsal Bones.—The inner small metatarsal bone was very rudimentary. Its inferior extremity extended to the middle third of the large metatarsal. In general outline it bore a close resemblance to the corresponding bone of a normal limb. The outer small metatarsal was extremely well developed. Its distal epiphysis was very massive, its volume exceeding that of the proximal end. Almost throughout its extent this bone was blended with the large metatarsal, and on their anterior aspect not the slightest trace of a division between them could be observed. Its outer surface was very much curved with the concavity directed outwards.

Two nutrient foramina were present. One of these—the upper—apparently penetrated the outer small bone in its superior third. The lower pierced the large metatarsal in its inferior third and in an upward direction. From it a distinct groove extended downwards, indicating that the course of the nutrient artery was retrograde.

The Digits.—Each of the two digits possessed two phalanges.

The first phalanx of the principal digit presented six surfaces, of which the superior and inferior were articular. The anterior and two lateral surfaces were blended. They were markedly convex in the transverse direction, whilst from above to below they were concave. The posterior surface was flat, and the V-shaped roughened area which is such a characteristic feature of the normal bone was represented simply by faint markings.

The distal bone was of an extraordinary shape. Passing transversely around it was a faint constriction dividing the bone into an upper prismatic portion and a lower somewhat flattened division, and suggesting that this bone represented the second and third phalanges of the normal digit fused together. They were firmly ossified.

On the anterior surface there were two small apertures in the position of the pre-plantar foramina, and faint pre-plantar grooves were present which led backwards, not to notches, but to complete foramina in the wings.

The wings were very prominent. They projected backwards to an abnormal distance, and were pointed at their extremities. There was no trace of division into basilar and retrocessal processes, and the lateral cartilages were absent.

On the inferior aspect the semilunar crest was absent, as also were the plantar foramina. Two very faint plantar grooves extended forwards and inwards, and became lost towards the centre of this surface. There was no trace of division into solar and tendinous areas, and the navicular bone was absent.

In the accessory digit there were also two phalanges. The first was distinctly nodular. Superiorly it carried a small elliptical, slightly depressed facet for articulation with the corresponding metacarpal bone. Posteriorly it was very slightly convex; anteriorly, laterally and inferiorly, markedly so.

The distal phalanx resembled that of the better developed digit in miniature. Like the latter it was quite symmetrical, but was somewhat flattened, being more compressed from before to behind.

It is difficult to offer any explanation of the problem presented by this interesting specimen. In the metatarsal region we have features which are even more suggestive of a possible transition from ordinary polydactyles to schistodactyles than in Cases IV and VII; such, for instance, as the extremely small and poorly developed inner small metatarsal bone, the extraordinarily well-developed outer small metatarsal bone, and its perfect blending with the large metatarsal. On the other hand, the phalanges in both digits, although presenting marked differences from the corresponding bones of a normal limb, are as yet quite symmetrical.

CASE VII.

This specimen was the manus of a foal with a peculiarly developed main digit and a prominent accessory digit on the outer side.

In the metacarpal region three bones could be distinctly felt. The innermost appeared to be almost normal, and the so-called "button" at its distal extremity could be felt without difficulty. Its position, however, was only about half an inch above the metacarpo-phalangeal articulation, so that the bone was slightly longer than usual.

A well-marked groove could be traced down the front of the specimen, evidently indicating the line of division between the large and external small metacarpal bone. It terminated about an inch above the principal metacarpo-phalangeal articulation.

The front of the metacarpo-phalangeal joint was very slightly broader than that of a normal limb. At the back of that carrying the principal digit and to the inner side was a somewhat rounded elevation. No trace of the horny excrescence commonly known as the ergot could be found. The integument was slit up to the metacarpo-phalangeal joint, the first phalanx of the accessory digit being enveloped in a separate fold.

The main digit was very much narrower than that of the horse. It was not symmetrical, and was more compressed from side to side. Its inner surface was convex; its outer almost flat. In general appearance it bore a striking resemblance to that of the fully-developed digit of the ox.

The Hoofs.—Here the resemblance to the ox was still more striking. The hoof of the accessory digit was much the smaller, otherwise it was exactly similar to that of the main digit. Both were symmetrical. Anteriorly the wall recurved on to the mesial aspect and became lost. The interior presented a deep cutigeral groove, and the horny laminae were well developed and nicely defined.

The Bones (Metacarpal Bones).—Three of these bones were present, corresponding to the large and two small bones in the normal limb. The innermost was longer than usual, a point which could be detected before the removal of the skin, as already remarked. It was, however, very much more slender.

The central metacarpal was the largest. It presented several features which call for special remark. In its length it was slightly but most peculiarly curved, and at its distal epiphysis was twisted forwards and outwards on its longitudinal axis. The inner half of this epiphysis was normal, but the outer half was considerably reduced in size, as though a portion had been chipped off. The facet for articulation with the outer small metacarpal extended for fully three-fourths of the distance down the bone. Superiorly it was broader and faced slightly more outwards than in the normal bone. Proceeding down the shaft it curved round the bone, and in its inferior portion looked directly outwards. At its inferior extremity it carried a convex facet for articulation, with the first phalanx in place of the pulley-like surface usually presented.

The general characters of this bone were such as to suggest a natural effort to accommodate the accessory digit alongside the one which was fully developed.

The external small metacarpal bone was exceeded in length by the central metacarpal by only half an inch. It was much curved in its length with the concavity directed outwards. Its proximal epiphysis in general appearance resembled that of a

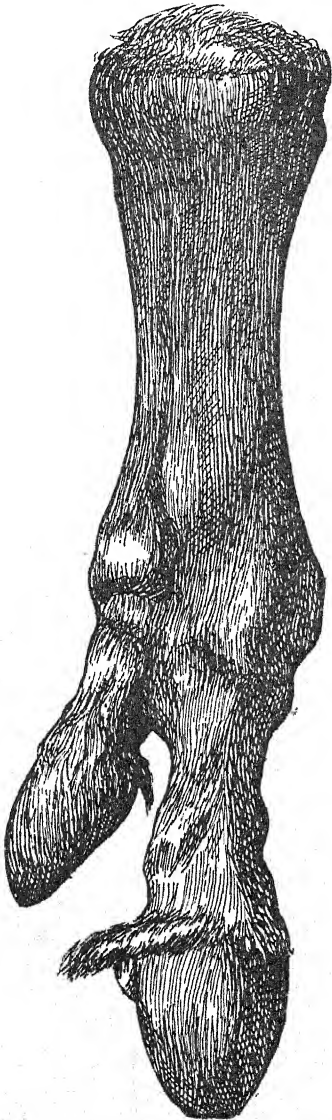


FIG. XVI.—Anterior aspect.

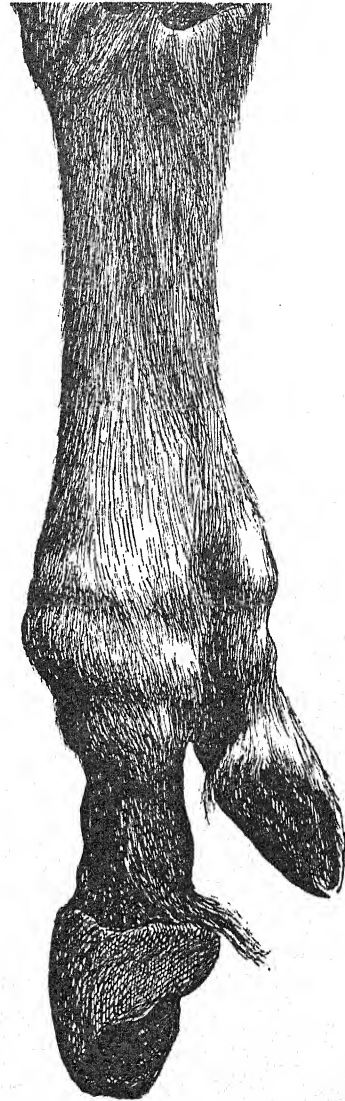


FIG. XVII.—Posterior aspect.

ILLUSTRATION OF CASE VII.

normal splint bone, with the exception that it was very much larger—being, in fact, more than double the size of that of the inner small metacarpal. On its superior aspect was a large flattened facet for articulation with the unciform bone. The inner surface carried superiorly two very small facets for articulation, with like facets on the large or central metacarpal, with which they formed synovial joints. Below these the surface showed an elongated triangular area with the apex directed downwards, and which was clearly applied to a similar area on the central metacarpal. But the bones were not united, as was the large to the inner small metacarpal. The distal epiphysis was very massive, being almost equal in size to the upper extremity. It was placed alongside that of the central metacarpal. Inferiorly it presented an articular surface which was elliptical in outline, the long axis of the ellipse being directed backwards and outwards. The surface was convex.

The Phalanges.—The large digit possessed three phalanges. The first was well developed. Superiorly it was depressed for accommodation of the convex area on the distal end of the large metacarpal bone. Its posterior surface was comparatively smooth and devoid of the roughened area for the attachment of the inferior sesamoidean ligaments. Its distal extremity was slightly narrower than usual, and was convex inferiorly, no antero-posterior groove being present.

There was nothing very peculiar about the second phalanx. There was no roughened area posteriorly for the attachment of the complementary cartilage, since this structure was absent.

The third phalanx was remarkable in that it bore a strong resemblance to the corresponding phalanx in the ox. It was, however, scarcely so much compressed from side to side. On its anterior surface there was one very large pre-plantar foramen from which a deep groove extended upwards. Another foramen, corresponding evidently to the outer pre-plantar foramen, penetrated the bone on its outer surface and close to the margin of this articular surface. The semilunar crest was absent, and the inferior surface was not divided into solar and tendinous areas.

A small pea-like sesamoid bone was present in this digit, but the navicular bone was absent.

In the accessory digit there were two phalanges. The first

represented the first and second phalanges of a normal digit which had become fused. This was apparent from a superficial examination of the specimen. These two phalanges were very symmetrical and well developed; in fact, with the exception that they were smaller, they were very like the corresponding phalanges in the large digit. The terminal phalanx was more rudimentary. Its anterior surface was markedly convex from side to side and almost straight from above to below, and was smooth. There was present superiorly a slight elevation in the position of the pyramidal process.

In the case of the main digit one wing only was present on the terminal phalanx. This was the inner, and there was a tendency to division into basilar and retrocessal processes. In the accessory digit there was a small backwardly projecting piece of bone in the place of the wing, and in this case on the outer side of the bone.

This specimen is of interest when considered in conjunction with Case IV. In the latter a possible transition between the ordinary polydactyles and the schistodactyles was suggested. The same suggestion is made here but in a less degree. This suggestion the following points appear to support:—

(1) The peculiar conformation of the distal extremity of the large metacarpal bone.

(2) The form of the metacarpal bone carrying the accessory digit, and the manner in which it is disposed.

(3) The long axis of its distal epiphysis is evidently arranging itself in line with that of the large bone.

(4) The tendency to a reduction in the size of the inner portions of the phalanges. This is most marked in the terminal phalanx.

(5) The asymmetrical but similar hoofs. Apart from the difference in size, were the hoofs alone examined, one would unhesitatingly pronounce them as belonging to one of the schistodactyles.

Attention has been directed to the striking points of contrast and similarity as they have occurred during the description of the specimens, and it is thus unnecessary to recapitulate them here in the form of a summary.

Reviewing the foregoing cases, however, it will be readily conceded that in the structure of supernumerary digits there are

frequently encountered anatomical features characteristic of the digit of some closely allied species. Not only is this so, but there is at least suggestive evidence that in such cases the tendency is to reproduce the normal anatomy of the digit of a member of some other group of the order rather than to duplicate the anatomy of the normal digit of the same species.

The writer desires to express his thanks to Professor Herdman, F.R.S., for many kind suggestions.

ABOUT ACARINA—THEIR HABITS, HOSTS, PRACTICAL METHODS OF EXAMINATION FOR, AND LIFE-HISTORY.

By THOS. B. GOODALL, F.R.C.V.S., F.I.L.S.

Christchurch, Hants.

(Continued from p. 182.)

Myobia may be found practically on all small mammals—moles, rats, voles, shrews, and mice, though the rat is probably their special host. They differ somewhat, both in size and detail, according to the host on which they are found. The very curious corkscrew-like twist of the first pair of legs, by which they cling on to the hair of their host, is well worth a close examination.

The *Myocoptes*, probably the smallest of the louse-mites, and found on the mouse and the shrew, has a modified twist in its two hinder pairs of legs.

The *Listrophorus* is also found on many small mammals, though the Mustelidæ (the stoats and weasels) are probably its most frequent hosts. The strange clasping arrangement of the palpi is well worth examination.

Dermaleichus.—The remarkable hinder legs of the males in the *Chelopis* are well shown. These are used as prehensile organs in the act of copulation, the huge claws clasping the whole body of the female. Many birds are infested by them, but the fact of just having found the dead body of a swift (*Cypselus apus*) reminds me that the swallow tribe appear to be more subject to infestation by acarina than any other bird. This one, which has evidently been dead for some hours, has numbers of the *Dermaleichi* on its head, and also two or three very lively large *Gamasidæ*, carried to the carcase in all probability by beetles.

I have mounted a female *Dermaleichus* in the very act of

“laying an egg.” The ovum is ovoid and large, about one-sixth the size of the “mother,” and it is extruded from under the body at a point that in insects and arachnida would be in the region of the thorax.

Dermanyssus.—A word about the *Dermanyssus avium*. They were taken from a crevice by the side of a perch in a very old wooden fowl-house. Some of them were placed in a glass-top box for further specimens and for watching. They were put on one side, and in the bustle of a busy time were forgotten. Some months afterwards, in raking out a corner of my shelves, I came across this box again, and to my astonishment I found it contained still living *Dermanyssus*, with a large quantity of *débris*. Of course, it must have been a case of the stronger preying on their weaker brethren, but it is a good illustration of the mode in which many of these minute forms of life may be kept going even after removal from their normal environment.

To verify or disprove the above for the purpose of correction in going over these notes, I took a scraping of the *Dermanyssus* from a crevice of an old poultry-house on August 29 last (1912). The scraping, which would about cover a sixpence, was put in a glass-top box, the edges of the lid and box were sealed together with stamp paper, and the box has been kept on my desk and examined frequently. They congregate in groups on the under surface of the glass, which they cover with what looks like a dirty sort of web; numerous large white round ova are deposited on this from day to day and I have found living *Dermanyssus* at the beginning of February.

Gamasidæ.—To those living in the country, this is perhaps the best known of all the mites. As a family they should be regarded as universal scavengers. At all times of the year they may be found in dung, on dead bodies of all kinds in the early stages of putrefaction, and on and about decomposing organic matters generally.

I look upon beetles, flies, and other insects on which they are found, sometimes (on the former especially) in great numbers, firmly adherent to the spaces between the legs at the under part of the body, merely as their carriers, and they probably leave these temporary hosts when they are deposited on their own food supply. It is almost as common to find it on the *Necrophaga* as the *Geotrupinæ*, and it is probably carried by these insects under-

ground, as the one buries small carcasses and the other tunnels under dung. I have found Gamasidæ in the carcase of a dog that had been buried for some weeks about three feet underground. A certain amount of moisture is essential for their existence.

Oribatidæ (Beetle-mites).—These are very common, and pretty generally dispersed. I have found them at all seasons of the year. One group of them, which I am unable to identify, I have always found on dead dermal appendages (horns, hoofs, &c.), and its function appears to be disintegration of these indigestible commodities. A certain amount of moisture seems to be essential for it to live, and it is invariably found on the under damp surface of its food supply. When placed on the slide of the microscope it has a strange habit of extending and retracting a very long proboscis.

Other *Oribatidæ* I have found on dead ligaments, cartilages, and bones.

Several genera, of which I have sent you only two or three specimens—the only ones preserved worth sending—may be almost constantly found under the bark of dead trees, standing or fallen. They are always found in large colonies, and are very active in their movements when first disturbed.

For the information of those who have not seen them and are interested, the *Oribatidæ* are always in groups, and look very much like very, very minute shining black beetles. The shell or carapace is very hard, and they can retract the whole of the body, rostrum, and limbs within the shell.

Another, which I think is the *Eremaus tibialis*, I have found frequently in dead cabbage stumps. As is only too well known to gardeners, these stumps are very slow to decay, almost as slow as the horns and hoofs of mammals, and the agriculturist generally clears them off his land and burns them in preference to leaving them to rot. Here again, then, the mites come in as most useful scavengers.

Taken altogether as a family, it appears to me the *Oribatidæ* should be regarded as man's very useful allies, disintegrating and returning to the elements such matters as would, in Nature, and without man's use of fire, become both noxious and dangerous.

Tyroglyphidæ.—I have included examples of these commonly distributed mites; they include the cheese-mites, sugar-mites, and others. A rather curious thing I have noticed is, that they are

generally associated with mould, being found on mouldy cheese, mouldy jam, mouldy fruit, &c. This does not, of course, apply to all of them, for if looked for they may be found in very strange places, as for example, in the Brazil nut.

A few words about the *Rhizoglyphus*.

It was found infesting the bulbous roots of *Ornithogalum album*; the bulbs were sent me by a florist in Cape Town in January, 1908.

They were potted in sandy loam on arrival here, and in 1908 they made fairly good foliage, but no flowers. In 1909 only two of the bulbs made any foliage (there were a dozen of them altogether), and in these only about an inch above ground. In July I took the roots out of the pots to search for the cause, and found the *Rhizoglyphus* in large numbers between the scales of the roots; the rootlets from the bottoms of the bulbs were destroyed.

The mite is oblong in shape, a line across the back marking off the abdomen from the thorax, the anterior part of the body is narrowed, a few setæ are in evidence round the body in a fresh specimen, but they are rendered invisible when mounted in Canada balsam.

The mouth parts are very large, an outer pair of mandibles on either side are thick and rounded at the base, where they form a single article. They are terminated by a pair of three-toothed chelate mandibles.

Inside these are a pair of more delicate maxillæ, terminated by single hooks. These are placed on either side of a sharp-pointed rostrum, or ligula, which appears to be barbed. These very pronounced mouth-organs agree rather with *Cheyletus*, but the legs agree with neither the *Cheyletus*, nor other *Tyroglyphidæ*. The two anterior pairs are separated from the two posterior pairs as in *Cheyletus*. They are all five-jointed, and terminated by a single claw without an onychia. The two anterior pairs are very thick and strong; the two posterior pairs are very small.

It is very probable that these mites were imported with the bulbs, and, if so, the fact affords ample food for reflection as to the possibilities of the modes of transmission of disease from one country or continent to another.

Quoting from Murray's "Handbook," p. 258, I find a mite of

the same genus has been described by M. Plancheon and by Mr. Riley as being found on the roots of vines in association with the Phylloxerae, but the description of it does not agree with this either as regards its mouth-organs or legs.

Again quoting from Murray's "Handbook": "Many writers on these mites (Dujardin, Claparède, Robin, and others) have described a curious circumstance in their life-history; they have observed what they have described as a Hypopus emerging from the body of Tyroglyphus or Rhizoglyphus."

As I was engaged in capturing these specimens, I noticed, on the scale of the bulbs in which they were, a number of bright chestnut-coloured spots, which were so firmly adherent to the root that I had the greatest difficulty in scraping them off with the points of my needles; indeed, I spoilt quite a number of them before I was enabled to get one transferred to the microscope slide, and then, lo and behold! I found it to be the dried skin of a Rhizoglyphus, covering what appears to be an ovum.

From this I should imagine that this mite behaves in the same manner as the larger "Scale" insects of plants, in which case the mature female becomes firmly agglutinated to the bark of the plant, and dries up, her hardened and dried body forming an effective shield for the eggs which are found under it, and which in due time emerge as larvæ.

It should be remembered that Glyciphagi are ubiquitous; they may be found wherever there is dust caused by the breaking up of epidermic scales, or feathers, or hairs, and it is important that they should not be confounded with symbiots or psoroptes, and because acari are found it is not wise to jump to too hasty a conclusion.

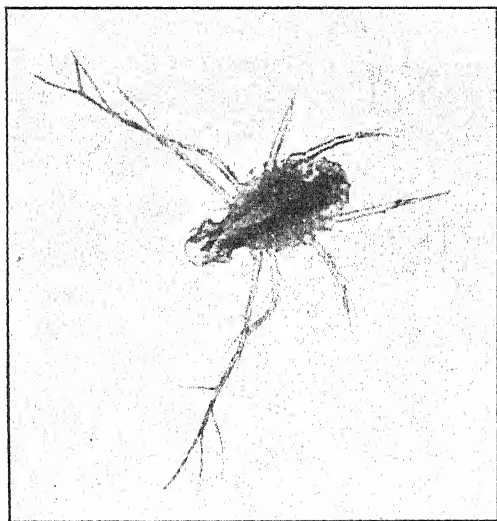
I well remember a case in point—it was years ago. I was called in to advise where there had been an outbreak of mange in a kennel of valuable terriers. On walking through a wood where they were exercised, I found numbers of acarina on some decaying wood, and not knowing so much of those creatures then as I did later, I formed the opinion that the terriers were infected from the wood, and, without giving my reasons, advised that they should not be allowed to go there. The mange was got rid of, and for some time I congratulated myself on my prescience, but I know better now, for acarina of one sort or the other may be found almost everywhere where organic matter of

any kind, animal or vegetable, is going to decay, and these are by no means always parasitic on animals.

If a cat were found in a rat-infested rick of corn, we should scarcely conclude that it was after the corn, but rather was on the look-out for the rats or mice that were enticed there by the corn.

Cheyletus eruditus.—This must be compared with the figure and the description in the "Handbook" to see the difference.

I have taken the *Cheyletus* from the inside of a dead and dry dragon-fly, in company with the *Tyroglyphus entomophagi*, on which it was no doubt preying, for it is decidedly predatory, and devours other and weaker mites.



Cheyletus eruditus from amongst Tyroglyphidæ in dust.

I have found it amongst Tyroglyphidæ in dust and amongst old bones, and on one occasion I captured one with a *Tyroglyphus* in its mandibles. I should say that it will be found that it preys on these acarina particularly, and may be found in the places frequented by them.

The mandibles are *very large*. The illustration in the "Handbook" gives no adequate idea of their size, and they are terminated by a pair of strong hooks.

The first pair of legs are twice the length of the next and other pairs. They are much branched and feathered, and are terminated by a pair of setæ; the setæ are all feathered. It is a

bright red colour, and it is most interesting to watch its actions amongst the white Tyroglyphidæ, for, whereas they move straight along in one direction, the Cheyletus takes jerky runs, first one way and then another.

Scirus.—A few words about this, I think, would be appropriate. This specimen was taken on the surface of the ground where the carcase of a mole had been buried by the Necrophaga beetle. It should be compared with the description and illustrations given in Murray's "Handbook."

In the fresh specimen a hollow tube may be seen running down the centre of the long-snouted proboscis, through which a round body, a valve of some sort, is constantly being exerted and retracted, while the maxillæ by the side of this are working. The antennæ, or palpi rather, are geniculated, and have on them a number of setæ. In one genus the body is oval and most beautifully coloured, a pink ground with black patches over the shield or carapace giving it the appearance of a splendid tortoise-shell.

Trombidium and Bryobia.—There is no need to say much about the harvest-mites or bugs, except perhaps by townspeople taking their summer holidays in sandy country districts. There is no doubt they can give rise to great annoyance by piercing, and probably insinuating themselves under the skin, and depositing a toxine. I have known people suffer real agonies from the irritation caused by these acarina.

They are also a common cause of great trouble to dogs in the warm summer weather. They may be found in great numbers as small red spots between the digits, and sometimes about the passages of the ears, in which position they cause as great annoyance as the symbiots.

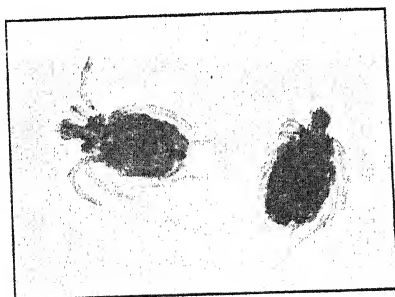
I have found samples of Continental hay literally swarming with acarina, notably in the autumn of 1892, when much was imported.

The acarina use many forms of bearers to convey them from place to place. I have mounted a few slides to show this, and until one knows it, one often wonders how it is they manage to intrude themselves into all sorts of apparently impossible places.

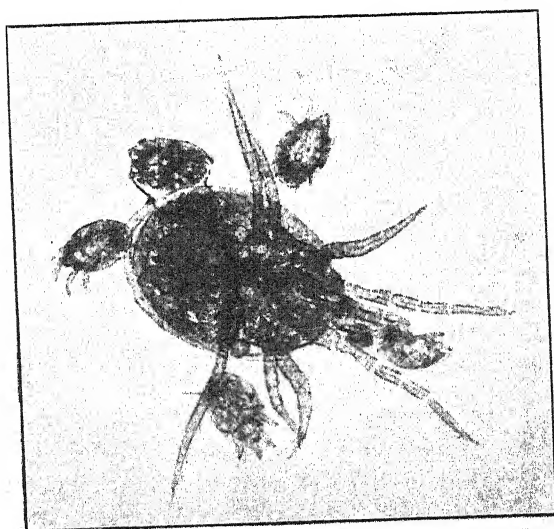
As an instance, I found Glyciphagi in my insect-preserving box, which was practically air-tight. I was determined to find



A small fly (*Musca*) infested with small red atoma (?).



Some of the atoma from the fly more highly magnified.



Gamasisid infested with hypopa (?). The small parasites were adherent before mounting. (From foreign hay.)

out how they got there, and I found a small hole made by one of the boring insects at the bottom of the box. No doubt this was their open door, but how did they get so far? They must have had a carrier, for they cannot fly.

They utilize the services of beetles, flies, and other insects, and larger acarina. (See slides.)

The facts of the longevity, or rather the power of retaining life through several generations, of some of the semi-parasitic acarina, even when cut off entirely from their normal food supply, and of parasitic acarina known to be present, though they may not always be found, should be instructive to veterinary practitioners.

It is not unusual to find that Glyciphagi and others that are parasitic on the bodies of birds and animals. The possibility has often occurred to me whether acarina may not be disseminators of blood parasites, as one family of them, the ticks, are, or the flies.

NOTES.

I.—Advice to Students.—In taking up this, or any branch of up-to-date science, always keep a Latin Dictionary and a Greek Lexicon at hand, and do not neglect to use them, and never let a word pass you without mastering its meaning. The right derivation and meaning of words will be found to be of the greatest help.

II.—For those who do not know what I mean by glass-top boxes, let me explain. They are entomological collecting boxes about the size of pill boxes, with glass tops. They are bought "nested."

III.—For an explanation of my frequent allusions to parts of the foot of the sheep, such as "fossa," "horny bridge," "sac," &c., I would refer readers to my article on "Foot-rot" in THE VETERINARY JOURNAL for October, 1891.

ERRATA.

In the March number, p. 111, in the seventh line from the top, pedunculated should read pedunculated.

In the last paragraph of the article in that number, p. 112, in the second and third lines, it should read *on* the Mustelidæ, and *on* mice and shrews, instead of *in*.

In the April number, p. 174, the illustration on the bottom right-hand corner should be described as the *Symbiotes felis*, not the *Psoroptes*.

And in the last line but one of that part of the article, p. 182, it should read "on grass at *my* place," instead of "on grass at *any* place."

[I very much regret that so few of my illustrations could be inserted by the publishers.

THOS. B. GOODALL.]

Clinical Articles.

ANCIENT HISTORY AND A POST-MORTEM EXAMINATION.

By E. GRANVILLE HASKELL, M.R.C.V.S.

Taunton.

THE subject was a very aged chestnut pony which was found unable to rise, and was destroyed, treatment not being attempted on account of its age.

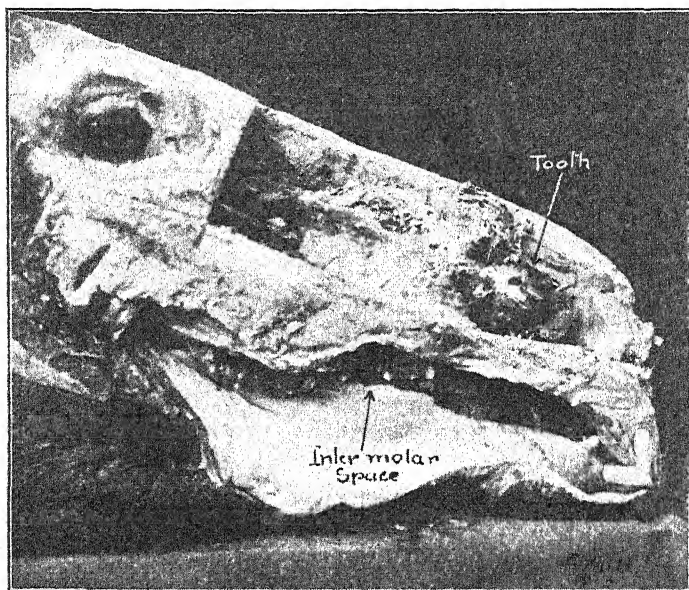
For some ten years the animal had suffered from chronic foetid discharge from the right nostril, and although at different times professional advice had been sought, treatment had been unsuccessful.

My own acquaintance with the case was made about a year ago, when I was asked to attend to the teeth on account of the animal having some difficulty in masticating its food. Examination of the mouth then revealed the existence of a small space between the first and third upper molars on the right side. The second molar was missing, but as I was told the tooth had been extracted many years ago little attention was paid to the part, more especially as the cavity appeared quite healed as far as could be ascertained on casual inspection; the adjacent edges of the first and third molars also nearly touched. At the same time attention was drawn to the nasal discharge. On examining the right nasal cavity with the fingers, a hard, bony body could just be felt, apparently quite immovable, and a portion of what appeared to be cartilage with rough, bony fragments embedded in it was brought away. A whalebone probe was passed fairly easily along the lower border of the nostril; respiration was

carried on through this side of the nose with difficulty. Owing to the age of the animal treatment was not asked, but a reserved diagnosis was given to the effect that the obstruction was probably due to a bony outgrowth in the nasal cavity as the result of injury.

The destruction of the pony afforded an opportunity of procuring the head for examination.

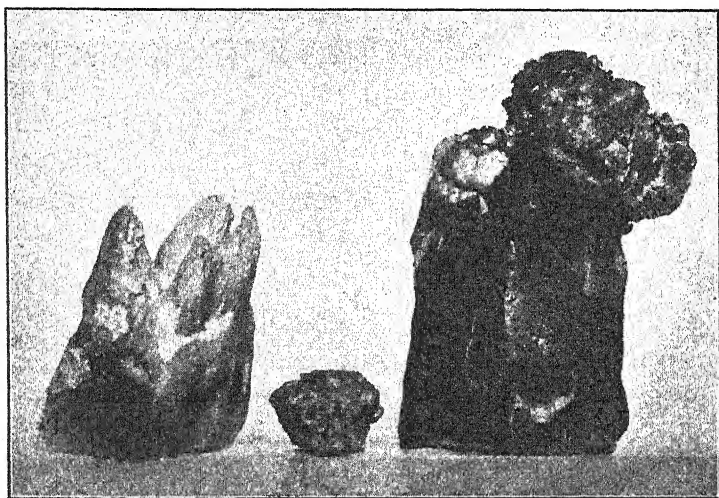
On removing the skin and outer bony boundary of the right nasal cavity an interesting state of affairs was disclosed. The



Photograph showing the extraordinary position of the missing molar tooth.

greater part of the nasal space was packed with a mass of evil-smelling decomposing food material and inspissated pus. Anterior to this and almost occluding the cavity was lying the missing second molar tooth. Its position was horizontal to the long axis of the head, with the crown directed forward, its anterior extremity being about 4 in. from the nasal orifice. On clearing away the foreign material it was seen that almost the whole of the anterior turbinated bone had disappeared. The edge of the posterior turbinated bone which springs from the superior maxilla was still present, thus forming, so to speak, a

linage over the posterior meatus, and keeping patent a small channel for respiration. The space thus formed between the existing plate of the posterior turbinated bone and the nasal bone was closely packed with the decomposing food *débris* before mentioned, which was prevented from passing forward by the tooth. Inquiry elicited the fact that food material had not been observed to pass (though probably a little did), but only a little greenish coloured fluid and thick nasal discharge. It was evident, of course, that there existed a communication between the mouth and nasal cavities, and this was discovered between the first and third molar teeth. There was here found a perfectly healed



Showing a comparison between the misplaced tooth and the one on the opposite side

channel passing upwards and inwards, about $\frac{1}{2}$ in. in diameter, and freely communicating between the two cavities. During mastication food must have been forced through this channel into the nose and from there backwards by way of the posterior nares to the pharynx. The presence of this food material had excited chronic inflammatory changes resulting in the disappearance of the greater part of the turbinated bones with occasional discharge of small portions of their cartilaginous prolongations through the nostril.

Further enquiry as to the history of any old injury having been sustained revealed the fact that some ten or twelve years

ago the teeth had been attended for the purpose of removing irregularities. Probably chiselling took place, the second molar was fractured at its insertion into the superior maxilla, and then was gradually forced upwards by the action of the lower opposing molar and intervening food until it reached the nasal cavity.

Comparison between the displaced tooth and the corresponding tooth of the opposite side is interesting. The crown of the former, not having been subjected to wear for so long a period, is more than double the depth of the latter, giving some indication of the time it has been in concealment. The roots of the displaced tooth have disappeared, their position being occupied by rough, granular osteophytes embedded in which may be seen a fragment of detached enamel. The tooth also appears to have been split in the direction of its length, two of the edges being extremely sharp. The rough, bony masses at the base of the tooth are probably the result of inflammatory action as the result of fracture of the alveolar cavity and before living union ceased between the fractured portion of the bone and the contiguous structures.

SHYING IN HORSES.

SUMMARY OF THE CONCLUSIONS OF DR. SUSTMANN, OF DRESDEN,
AFTER MANY OBSERVATIONS.

(1) SHYING may be noticed in all breeds of horses and at every age. However, high bred and pure bred races, with or without admixture of Arab or thoroughbred blood, are most inclined to the defect. So also are in-bred and incestuously bred animals.

(2) The cause of shying is due to a sudden and unexpected irritation of one or several organs of sense. Nervous irritability evinces itself in the horse's body reflexly or instinctively by rapid dislike or dread and declares itself externally just as quickly by symptoms of fear, of displeasure, or the impulse to run away from the impression. Diseases of the organs of sense and those which depend on a nervous basis may favour and increase the act of shying.

(3) The rise and decline of the effect of the irritability bears a relation to the degree of the first irritation and the resistance encountered.—*Deutsche tierärzt. Woch.*

AN UNRIDABLE MARE CURED BY OVARIOTOMY.

BY STAFF VETERINARY-SURGEON SEIDLER.

A DARK brown eight-year-old mare belonging to an infantry officer had always been somewhat ticklish when grooming and riding, and for three months had become so obstinate and restless that the officer concerned was no longer able to use her. As soon as the rider approached the animal in order to mount her, she began to shriek, struck out, and went round in a circle. When he succeeded in mounting her, she bucked continuously, went round in a circle squealing loudly, then stood stock still, winking her vulva, and seemed as if rooted to the ground, being quite immovable even by use of the spurs. At times the mare was quieter for ten to twenty minutes, and answered to all demands of the rider. Then again the rider could do nothing with her, and had to get down. The symptoms were not those of staggers, and previously the mare had not resented saddle pressure. Chronic disease of the ovaries was therefore assumed. As in this chronic irritable state the mare was almost valueless, it was resolved to spay her.

The animal was consequently kept on low diet for three days, and by suitable disinfecting irrigations of the external genitals was sufficiently prepared. The vagina was washed out once daily with weak lysol solution. The operation was then conducted after the hind legs had been secured. Before operating, the rectum and bladder were emptied, the external genitals and their surroundings disinfected, and the vagina once more washed out with lysol solution. Half an hour previously the mare had a clyster of 75 grm. of chloralhydrate. The operation was performed according to Bayer's method with the chain écraseur. The locating of the ovaries and putting on of the chain was accomplished without any great difficulty. The subject remained rather quiet during the operation. The two ovaries weighed together 170 grm. (left 88 grm., the right 82 grm.), appeared greyish-red, felt hard, and were studded with protuberances of the size of a child's fist. The protuberances were fluctuating on pressure; on cutting them a yellowish watery fluid escaped. On the right ovary were four large follicles, on the left six. The inner surface of the follicle walls was smooth and on section as thick as the back of a dissecting knife blade.

After the operation the animal was raised behind and dieted for fourteen days. The first four days the mare was dull but ate the food given quite well. The temperature at first 39° C. gradually declined to 38.2° on the fourth day. After four weeks the saddle was put on and the mare ridden again.

On mounting she was at first rather ticklish, but showed no obstinacy and went quietly. She was subsequently ridden every day, and there was no difficulty in sitting or riding her. In three months she was so quiet that she could be ridden by a lady. Degeneration of the ovaries was evidently the cause of the defect in this mare.—*Zeitschrift für Veterinärkunde.*

THE THERAPY OF OBSTRUCTION OF THE OMASUM.

By R. BISSAUGE.

INDIGESTION, or obstruction of the omasum, is seldom a primary but often a secondary ailment, which is always accompanied by an inflammatory condition of the mucous membrane of this organ and which frequently comes under notice in practice; it is an obstinate disease, hard to overcome. The author considers the cause to be a gastro-intestinal auto-intoxication causing interruption of the motile power of the omasum, on which account it is frequently connected with a lack of activity of the rumen. The quality of the food cannot be blamed. Spontaneous cure only occurs exceptionally; cure can only be attained by a rational, methodical, and sufficiently long continued treatment.

The author distinguishes several indications in the treatment: (1) The dilution of the impacted food between the leaves of the omasum; (2) the inciting of the contractile power of the organ; and (3) the combating of symptoms of auto-intoxication.

The dilution of the impacted food is best accomplished by warm, mucilaginous fluids in large quantity (20, 25, 30 litres in a day), given as drenches if the animal will not drink. When drenching it is important to give slowly and in unison with the gulps of the animal, so that a specified part of the fluid gains the omasum. Decoctions of linseed, mallow, or barley, made as a rather thick mucilage, but not pasty, are suitable for administration.

The introduction of large quantities of water into the rumen by means of a canula, as recommended by Hohne, is not

countenanced by Bissauge, because paresis of the organ is favoured thereby.

After two to three days of dilution one begins to try and establish contractility of the omasum by means of warm aromatic medicaments, such as infusions of peppermint root, green tea, sage, wormwood, and camomile, which act chiefly on the atony of the rumen and by continuation on the omasum.

These infusions are given cautiously with a small quantity of alcohol, or better with hydrochloric acid, in order to overcome dyspeptic symptoms.

The author has used the following with success for some years:—

(1) Herb. menth. pip., herb. absinthi, herb. trifol. fibr., flor. cammom. vulg. āā 25.

M.D.S.—Boil with 1½ litres of water and strain.

(2) Spirit frument. carv. 250, acid hydrochlor. dil. 40, tinct. nux vom. 30.

Give three times daily with half a litre of the above infusion.

The medicine is used up in twenty-four hours and may be repeated without injury.

Copious clysters of cold salty water or diluted creolin aid in the evacuation of the bowels and combat absorption of toxin. After diluting the contents of the omasum the author has frequently been successful with barium chloride, 15 to 20 grm. given three times daily, as an electuary. Rumination ceasing, 5 to 10 grm. of ipecacuanha may be given in a warm aromatic infusion.

The best excitants of contractility of the omasum are eserine, veratrine, pilocarpin, or arecolin. It is advisable to inject weak doses, 1 to 2 or 3 cg. at the most. Veratrine is especially to be used with caution in cattle practice. The author considers arecolin effective and little dangerous. Massage of the rumen and the giving of hay tea, grain concoction, or whole milk helps. Drinks and aromatic infusions should be given until the excrement is normal.—*Revue Générale de Médecine Vétérinaire*.

[The translator has had most success in the treatment of this complaint during the last three years by using "Arecovetrol" capsules (a combination of arecolin, veratrine, and strychnine) dissolved in linseed tea, and nothing but these for four days at least. "Obstruction" of the omasum is a better word to use than "impaction." A certain amount of "impaction" would always seem to exist.—G. M.]

Canine Clinical.

METASTATIC CHONDROMATA IN DOG.

By R. J. FOREMAN, M.R.C.V.S.

Tottenham, London, N.

Subject.—Irish terrier bitch, aged 11 years.

In June, 1912, a large, very heavy tumour was removed from posterior mamma. This tumour used to knock on the ground when she ran about. It weighed over 1 lb., and was of same character, cartilaginous and bony, as those subsequently found internally. Recovery took place by first intention and animal was sent home in ten days. No sign of recurrence was visible six months later.

January 18, 1913. Called in to bitch; found her rather distressed in breathing and for few days she had been unable to jump on chairs as usual. On palpation I found a large lump on the near side of the abdomen and a smaller one on the off side, freely movable. They appeared to be painless and there was no distension of abdomen, but animal seemed to be very heavy. I gave iodides, arsenic, and aspirin and allowed them to give her a good time and any diet; and prognosed death in about six weeks; thought they were ovarian tumours.

January 31. I called and found bitch much better. No distress, quite lively; tumours slightly increased in size; appetite very good.

February 27. Died suddenly after taking food.

Post-mortem.—Upon opening the abdominal cavity I found large tumours of the liver and spleen not attached to but in the tissue of each organ, leaving very little of either organ intact. It seemed very surprising to me that the general health had remained so good. Only a little distress occasionally in breathing, which was relieved with an aperient. The last two or three days she had been unable to stand without help, but all the past year, right up to death, she appeared to be a happy, lively animal. The owners did not wish for her destruction unless she was suffering pain. I could not say definitely that she was, and they did not mind any trouble in looking after her.

I took the tumours to Professor Wooldridge, who reported that they were ossifying chondromata, and were apparently

secondary to the mammary tumour. He further stated that metastatic chondromata were very rare, and advised me to record the case. The tumour in the liver weighed 1 lb. 10½ oz., and that in the spleen 1 lb. 3½ oz.

THREE INTERESTING CASES OF CANCER.

By FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.

Kensington, W.

Case 1.—The subject was an exceptionally intelligent Aberdeen terrier bitch, aged 7 years, and the animal had enjoyed excellent health until December of 1911, when she became "out of sorts" and ill at ease after any exertion. At first this was put down by the owner, a well known West-End physician, to bowel derangement, and after these had been put in good order she certainly was brighter. When I was called in there was distinct respiratory disturbance, and it was quite clinically evident that there was effusion into the pleural cavity. On three separate occasions in December and January the chest was tapped, twice on the right side and once on the left, on each occasion fluid being withdrawn, once as much as three and a half ounces. Bacteriological examination of the fluid revealed nothing definite. After each operation she appeared to obtain great relief, but in November of 1912 she began to get emaciated, and finally died.

Post-mortem examination revealed the presence of a carcinoma involving the upper part of the left lung, and pressing on the large vessels in that region, and also on the œsophagus.

Case 2.—In December of 1912 my opinion was requested over the case of an Aberdeen terrier bitch aged about 7 years, the subject of an enlarged abdomen, which I diagnosed at the time as ascites. As the animal was a very great pet, and in no immediate danger, a course of potassium iodide was prescribed with suitable dietary and nursing, and the owner was told of the probable sequel and the necessity for an operation in the near future. Taking her on a visit into the country, as she appeared to become distressed, the services of Mr. J. C. Deville, M.R.C.V.S., of Uttoxeter, were called in, and he performed *paracentesis abdominis*, removing a quantity of clear fluid from the abdomen. This gentleman then advised that the bitch should

be returned to me in London, as when the fluid was removed a large tumour could be distinctly felt within the abdomen.

On January 5, under chloroform anæsthesia, an exploratory laparotomy was made, the incision extending from sternum to pelvis (and afterwards requiring twenty-seven sutures to close up), and the internal tumour found to be in the left ovary, which was literally as large as an orange, and had become adherent to the spleen and to the stomach. Six large vessels were ligatured and the whole of the uterus with both horns and ovaries removed, also by ligature. Recovery was absolutely uninterrupted, fourteen of the sutures being removed eight days later, and the remainder on the twelfth day. The only treatment of the abdominal wall was the shaving and painting with tincture of iodine immediately prior to operation, whilst afterwards nothing other than the application of tincture of iodine once a day, and clean cotton wool with a clean bandage each time was used, the wound healing *per primam*; no application of the scrubbing-brush, or even soap and water.

The left ovary (enlarged to the size of a large orange by tumour tissue) weighed 26 oz. and the right one (normal size) 9 gr.

I sent the specimen to Sir John Bland-Sutton, F.R.C.S., of the Middlesex Hospital, who kindly examined it, and reported that it was carcinoma.

The bitch was very bright and lively during her convalescence in hospital, and was returned home on the 22nd. Whether she had another growth or not somewhere we never discovered, but after she had been home a week she was taken suddenly ill with sickness and dysentery, and died within twelve hours.

Mr. Deville, M.R.C.V.S., who was called to attend her, wrote as follows: "You will be surprised to hear that General H. has lost his little bitch. I feel very sorry, as she came out of the operation so well. I was called to see her on Thursday afternoon, when I found her in a very weak state. She was very distended in the abdomen (gas) with foetid breath. On Friday night I was called out to see her, and I found her in a comatose state and she remained in that condition until death took place 10 a.m. Tuesday. She vomited a good deal, and I gave her Parke-Davis elixir taka-diastase, which had the desired effect, brandy and digitalis; in fact she was in such a state I could do very little."

Unluckily we were unable to obtain permission to make a *post-mortem* examination.

Case 3.—The patient was a half-bred Persian cat, said by the owner to be at least 15 years old, and attention was drawn to its mouth by the fact that the animal was continually stroking the right side with its paw. Examination revealed a loose tooth, the first premolar, which was extracted without difficulty, and it was noticed that the buccal mucous membrane was swollen and ulcerated. The condition of the animal became worse, there was evident soreness when attempting to take food, and marked emaciation.

Within six weeks of the time when the growth was first noticed it had become as large as a Barcelona nut, and was very foetid, the surface being ulcerated. The animal was destroyed with chloroform, the tumour proving to be a carcinoma.

ŒDEMA OF THE HEAD IN A DOG DUE TO SWALLOWING A FOREIGN BODY.

By M. GAUCET.

Brussels.

A COLLIE DOG suddenly developed œdema of the head, especially round the eyes, which were retracted in their cavities. The owner thought the dog had injured its head by falling. This opinion was contradicted by the dog coughing much, and showing an inclination to vomit during the examination. Gaucet at first thought there was a mechanical obstruction in the gullet, but nothing could be found there. Then urticaria, in which there is often swelled head, came to mind, but the swelling here was compact, and diffusely spread over the whole head. Doubt was soon set at rest by an emetic, causing the evacuation of a child's torn india-rubber ball, whereupon the coughing and vomiting ceased, and in a few days the œdematous swelling disappeared. The foreign body had been fixed in the anterior part of the intrathoracic œsophagus, and had there exercised strong pressure on both jugular veins, so that stoppage of blood occurred in the region drained by the head veins. Dilatation of the whole of the capillaries of the part, and a sudden serous transudation into the subcutis, the papillary bodies and the corium of the head had arisen.—*Deutsche tierärztl. Woch.*

ANIMALS (ANÆSTHETICS).

A BILL TO MAKE FURTHER PROVISION FOR THE PROTECTION OF
ANIMALS FROM CRUELTY.

(Presented by Mr. Walter Guinness, supported by Dr. Addison, Sir Frederick Banbury, Lord Henry Cavendish-Bentinck, Mr. Butcher, Mr. Courthope, Mr. Greene, Colonel Lockwood, Mr. Mills, Sir Charles Rose, and Mr. Snowden.)

BE it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

OFFENCES.

1.—(1) If any person shall subject or cause or procure, or being the owner permit to be subjected an animal to an operation contrary to the regulations contained in this section, he shall be guilty of an offence under this Act.

(2) (a) A horse shall not be subjected to any operation specified in the First Schedule to this Act, and a dog shall not be subjected to any operation specified in the Second Schedule to this Act, unless the animal during the whole of the operation is under the influence of some general anæsthetic of sufficient power to prevent the animal feeling pain.

(b) A horse two years old and over shall not be subjected to the operation of castration unless during the whole of the operation he is under the influence of some general anæsthetic of sufficient power to prevent him from feeling pain.

(c) A horse shall not be subjected to any operation specified in the Third Schedule to this Act unless during the whole of the operation it is under the influence of some general anæsthetic or some local anæsthetic being, in either case, of sufficient power to prevent it feeling pain.

PENALTIES AND APPEALS.

2.—(1) Any person who is guilty of an offence under this Act shall be liable on summary conviction in respect of the first offence to a fine not exceeding five pounds, and in respect of any second or subsequent offence to a fine not exceeding twenty-five pounds, or alternately, or in addition thereto, to be imprisoned with or without hard labour for any term not exceeding three months.

(2) An appeal shall lie from any conviction or order by a court of summary jurisdiction under this Act to quarter sessions.

POWERS OF BOARD OF AGRICULTURE AND FISHERIES.

3.—(1) The Board of Agriculture and Fisheries may, by order made subject to the provisions of this section, add any other

operation to the operations specified in any schedule to this Act, and any operation so added shall be deemed to be an operation specified in that schedule, and the Board of Agriculture and Fisheries may also by order made as aforesaid extend any provision of this Act to any domestic animal to which it does not at the time apply, with such modifications or additions as may appear to that Board to be necessary.

(2) The draft of any such order shall be published for a period of two months before the order is made, and the Board of Agriculture and Fisheries during that period shall receive and consider any representations made to them with respect to the order by any persons appearing to them to be interested in the subject of the order.

(3) The order, when made, shall forthwith be laid before Parliament, and shall not take effect until it has so lain for thirty days before each House of Parliament, being days upon which that House has sat, and if a resolution is passed by either House before the expiration of such days declaring that the order be annulled, the order shall not take effect, but if no such resolution is passed the order shall take effect on such day after the expiration of the last day on which any such resolution might have been passed as the Board of Agriculture and Fisheries may appoint.

DEFINITIONS.

4.—In this Act, except the context otherwise requires, the expression “dog” includes any bitch, sapling, or puppy; “general anæsthetic” shall include chloral hydrate, and in the case of a dog morphine.

SHORT TITLE.

5.—This Act may be cited as the Animals (Anæsthetics) Act, 1913.

SCHEDULES.

First Schedule.

Radical operation for quittor.
Line firing.
Operation for stripping the sole.
Radical operation for poll evil.
Radical operation for fistulous withers.

Second Schedule.

Castration.
Ovariectomy.

Third Schedule.

Neurectomy or unnerving.
Enucleation of the eyeball.
Trephining.

Review.

A System of Veterinary Medicine. By various writers, to be complete in two volumes. Edited by E. Wallis Hoare, F.R.C.V.S., Lecturer in Veterinary Hygiene, University College, Cork. Vol. i, pp. xvi + 1350. Price £1 1s. net. London: Messrs. Baillière, Tindall and Cox. 1913.

Mr. Wallis Hoare undertook a big task when he decided to edit a system of veterinary medicine in two volumes, of which the first volume is now ready. The list of collaborators is in itself a guarantee for the excellence and reliability of the matter contained. As the author, or rather editor, says in his preface, "No individual, even though he possessed the widest experience of diseases in animals, and had unlimited time at his disposal, could unaided, either compile or write a work on veterinary medicine so as to do anything like justice to the subject." Consequently Mr. Hoare has obtained the assistance of British veterinarians at home and in the colonies and India to write up fully the various diseases, and therefore it may be taken for granted that almost every chapter has been written by an expert in the subject allotted to him.

The work treats of diseases of all the domesticated animals and of birds and fish, and the first volume is devoted to the microbial diseases.

The work is too large to permit of our reviewing it in detail, and in such a work there must of necessity be some views and conclusions with which the reader will disagree. However that may be, we congratulate the editor on his first volume, which will undoubtedly rank as a classical work for some time to come.

We unhesitatingly recommend both students and practitioners to obtain a copy. The price, *viz.*, one guinea per volume, is ridiculously small compared with the enormous amount of really up-to-date information it contains.

The work of the publishers is carried out in their well-known good style.

Sektionstechnik der Haustiere. (*Post-mortem technique of the Domesticated Animals.*) By Dr. Max Schmey, Veterinary-Surgeon at the Depôts of the City of Berlin Destructor School.

This German publication by the firm of Ferdinand Enke, of Stuttgart, consists of 212 pages of letterpress and 58 illustrations in the text. It is a manual of instruction for veterinary surgeons and students, containing full information as to how to conduct *post-mortems* in a scientific and methodical manner in order that all conditions, whether healthy or diseased, may be carefully noted.

The book is divided into three sections. The first deals with the instruments and general rules for conducting autopsies; the second treats of the methods of opening the cavities and

examining the organs and tissues of the cadaver; the third enumerates and shortly describes the various diseased conditions likely to be encountered on making *post-mortems*.

There is an illustration of a double saw (among those of various handy *post-mortem* instruments), which is exceptionally useful and time-saving when opening the spinal canal, a part of the animal organism which is frequently given the go-by, or imperfectly examined, because of the difficulty in getting at the cord. The author disapproves of putting iodoform collodion on personal wounds accidentally received when conducting autopsies, because the inflammatory processes of an infected wound may easily develop under the collodion. He advises thorough cleansing of the wound with soap and water and afterwards putting on a few drops of alcohol and ether or acetic acid, then a light bandage and india-rubber finger-stall, and only thus can further *post-mortem* procedure be safely conducted.

In the third section there are some very useful tables giving the dimensions and weights of the healthy organs of the different domesticated animals.

Where *post-mortem* conditions are important as evidence at law the carrying out of autopsies as indicated in this book ought to safeguard anything of importance being missed, and enable exact conditions to be concisely and correctly given by the professional witness.

The work is necessarily of the cyclopædic type, and a full revelation of all the good things in it cannot be referred to in a short review. Suffice it to write that we have seen nothing like it in the English language, and it would very well bear translating into the Anglo-Saxon tongue for the benefit of veterinary surgeons, meat inspectors, medical officers of health, and veterinary students.

G. M.

LITERARY NOTE.

MESSRS. BAILLIÈRE, TINDALL AND COX announce the publication of the second edition of Castellani and Chalmers's "Manual of Tropical Medicine." Although less than three years have elapsed since the first edition of this work was issued it has won for itself universal recognition, and has become indispensable to all who are interested in the study of Tropical Medicine. The work has been subjected to a thorough revision from cover to cover, and includes all the most recent researches on the subject. Many of the chapters have been entirely re-written, and a number of new ones added to the extent of about 500 pages. There are 250 new illustrations, but notwithstanding its enlarged size the price will remain as heretofore.

Translation.

HÆMOPHILIA, HÆMORRHAPHILIA (BLOOD DISEASE).

BY DR. FRIEDRICH SCHICK,
of Reichenau.

IN a long article Schick discusses the views of authors on the causes of hæmophilia and gives a description of a case of hæmophilia in a seven-year-old greyhound, in which, at the wish of the lady owner, a wound was made at the inner side of the left stifle joint for the removal of a foreign body. Already, when originally injured, the dog had bled so profusely that the attending veterinary surgeon had encountered great difficulty in checking the severe hæmorrhage. Schick only dilated the wound a little and removed the foreign body. Bleeding then set in so severely that he tried in vain to arrest it from 9 o'clock in the morning until 6 o'clock at night. In the meantime anæmic symptoms and heart weakness set in and only then the hæmorrhage came to a standstill. By means of a camphor injection the general condition was again improved, but on the next day bleeding occurred and lasted several hours, but it was checked; nevertheless, it recurred in the evening and again the next morning. In spite of this the animal recovered and the wound healed.—*Berliner tierärztl. Woch.*

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.

THE VETERINARY JOURNAL

JUNE, 1913.

Editorial.

VETERINARY CHARITIES.

IN a previous issue of THE VETERINARY JOURNAL we drew attention to the spirited action of Mr. Percy Simpson in persuading a very powerful party of amateur actors and actresses to give their time and services for the production of "Sweet Lavender" on behalf of the Victoria Veterinary Benevolent Fund. Now we are very pleased indeed to congratulate him and them on the performance and on the really magnificent result of their work. As will be seen from the short statement of accounts on pp. 291-2, the Fund will benefit by the really wonderful amount of £70. Such a sum far and away exceeds our most sanguine hopes, and our sincerest and unstinted thanks are due to all those who assisted in attaining it, either by their services or by their generous donations and the purchase of tickets.

As to the performance, we may say, with absolute truth, that it was far and away the best amateur performance it has ever been our good fortune to witness. The flattering notice which it received in the local Press must have been very pleasing to the producer and players, but they must have been even more pleased with the good notice accorded to the performance by *The Stage*, a paper which has a habit at times of telling unpalatable truths with almost brutal frankness. And to think that this was all on behalf of a veterinary charity and, with the exception of Mr. Simpson, by people who have no direct association with our profession, makes us all the more grateful.

A criticism of the individual performers would convey very

little to our readers, as the former (with one exception) are personally unknown to them, so it must suffice to say that there was not a weak spot to be found in the cast. The exception referred to above is, of course, our esteemed *confrère*, who organized the performance. He took the rôle of Clem Hale, whose duty, and a very pleasant duty it appeared to be, was to woo and to make love to Sweet Lavender. Many of us are already aware of Mr. Simpson's marked ability in his legitimate profession; his histrionic ability is not far behind, and apparently in the happy pastime (shall we call it so?) of making love, he is certainly a past master. But who could not have made love to Sweet Lavender?

The great success of Mr. Simpson's effort should go far to encourage other members of the profession to "go and do likewise." There are many other ways in which the Fund might be helped if only members will exercise a little ingenuity and devote a little time to this "labour of love." One should not be deterred by the excellence of Mr. Simpson's results; on the contrary, one should be encouraged, and should remember that every little helps, and that "many mickles mak' a muckle."

On behalf of our less fortunate *confrères* and their widows and orphans, we offer our most sincere thanks to Maidenhead and to all who helped to make such a success, including the producer, the players, the "great unseen," the orchestra, the dainty programme sellers, and the makers of the very pretty "Sweet Lavender" bags given and sold for the benefit of the Fund.

General Articles.

SHORT NOTE ON THE PREVALENCE OF BOVINE SARCOPTIC SCABIES.

By A. W. NOEL PILLERS, F.R.C.V.S.

Liverpool.

IN THE VETERINARY JOURNAL for 1909, p. 434, I gave an account of an outbreak of sarcoptic mange amongst housed milking cows, together with a review from Neumann [1] of the comparatively rare occurrence of the disease. In the outbreak there recorded twenty-six out of fifty-nine animals were affected. Since that time I have paid some attention to this disease and find that during the winters of 1911 and 1912 it was the only mange I was able to find in housed cattle in this town. Statements as to its rarity are to be found in many writings. The Board of Agriculture and Fisheries [2] state that sarcoptic mange is uncommon. Law [3] mentions isolated cases described by Continental authorities. Megnin [4] stated that after six to seven years' research he had yet to see his first case of bovine mange of any kind, but he quotes Hering, Furstenburg and Delafond to show that sarcoptic, chorioptic and psoroptic mange do occur in cattle. He does not include a description of his own of the parasite in the text, but gives Hering's details and measurements. In housed cattle I have only been a little more successful than Megnin, for whilst he was unable to find any of the three forms, I have often come across sarcoptic mange to the exclusion of the others. Raillet [5] is equally sceptical concerning this mange. He mentions several authors' cases, and supposes that they have been dealing with transmissions either from the horse or cat. Freidberger and Fröhner [6] devote five lines to the disease, and add a short note to the effect that there is no longer any doubt as to its actual occurrence, as numerous cases have been recorded during recent years. The above authorities have been quoted with the hope of stimulating microscopical examination of skin lesions in cattle.

During the last two winters the disease has been encountered in fifteen centres, involving in all forty-seven animals, and this to the exclusion of other forms. Each case has been diagnosed by the presence of the sarcopt, which seems easier to find than that of the horse and dog, almost as easy as in the cat.

The disease possessed the same features as mentioned in the last article, *viz.*, marked irritation in warm sheds, appreciably lessened the quantity of milk given, affected the same parts, caused irritation to the attendant's arms, and disappeared when the animals were turned out to grass in May or June. The diagnosis of *Sarcoptes scabiei bovis* in scrapings was kindly confirmed by several veterinarians in most of the outbreaks.

This short note has been recorded to help to show that sarcoptic mange in the ox is more prevalent, at least in this country, than is supposed. One cannot help but notice in most of our text-books a great similarity in the names and cases mentioned, without original observations to prove or discredit the statements of older observers and writers.

REFERENCES.

- [1] NEUMANN. "Parasites and Parasitic Diseases of the Domesticated Animals." Translated by Professor Macqueen. 2nd edition, London, 1905, p. 146.
- [2] Board of Agriculture and Fisheries, Leaflet 135, "Mange in Cattle," London, 1907.
- [3] LAW. *Veterinary Medicine*, 2nd edition, vol. v, p. 203.
- [4] MEGNIN. *Les Parasites Articulés*. Paris, 1895, p. 348.
- [5] RAILLET. *Traité de Zoologie Médicale et Agricole*. 2nd edition, Paris, 1895, p. 65.
- [6] FREIDBERGER and FRÖHNER. *Veterinary Pathology*. 3rd edition, London, 1905. Translated by Captain Hayes, F.R.C.V.S., vol. ii, p. 488.

THE DOSING OF SHEEP WITH COOPER'S DIP AND BLUESTONE FOR WIRE-WORMS.*

By DR. ARNOLD THIEILER, C.M.G.
Acting Director of Veterinary Research.

IN No. 3 of the *Agricultural Journal*, March, 1912, a series of experiments were enumerated which were undertaken to find out the maximum dose of a mixture consisting of equal quantities of bluestone and Cooper's dip, in dry powder form, which could be given to a number of sheep ageing from two-tooth upwards without risk of mortality. A total number of 147 sheep were dosed with 15 gr. of bluestone and 15 gr. of Cooper's dip, and none died from the effect of this dose; one of the experimental sheep succumbed after dosing from accidental causes. This dose was accordingly considered to be a safe one. In another series of experiments it was shown that when, to a safe dose of these

* See also *VETERINARY JOURNAL*, June, 1912.

drugs, such non-poisonous materials as salt and sulphur were added in equal parts, the otherwise safe dose of Cooper's dip and 15 gr. of bluestone caused death. It was then concluded that under our conditions the safe maximal dose, *i.e.*, 15 gr. of Cooper's dip and 15 gr. of bluestone, could not be recommended indiscriminately, because it was thought that in practice the local conditions on the different farms might influence the toxicity of the safe dose just as the addition of the harmless substance had done. For this reason it was strongly recommended that a farmer who wished to increase the dose of any of the drugs should first of all experiment on a small number of sheep, taking care that the initial trial was conducted under the representative conditions of his farm. If it was found to be successful it should be repeated on a larger scale, and not until the farmer had convinced himself by trials on a number of sheep that he had found the dose which met the conditions on his farm should he dose the whole flock.

A farmer in the Stutterheim District used the dose alluded to, *viz.*, 15 gr. of Cooper's dip and 15 gr. of bluestone, on a number of sheep, interpreting my recommendation to mean that this dose was the one recommended under all conditions, and that trial experiments as suggested by me only referred to larger doses. The result of this dosing was somewhat disastrous, as a number of sheep died from poisoning. The farmer was good enough to immediately draw our attention to this result, asking at the same time for an investigation. As it was first thought that a mistake had occurred in the dosing, attention was given to weight and measurement, but it was found that these were correct. It had, therefore, to be concluded that the cause of the discrepancy in the results of the two places, *i.e.*, on a farm in Stutterheim District and in the Laboratory at Onderstepoort, lay either in the conditions of the farm itself or in the sheep. However, one important fact was forcibly brought home, namely, that the mortality on the Stutterheim farm only occurred amongst the *two-tooth sheep*. As the matter was of the greatest importance, and the opportunity had offered itself to repeat the experiment under the conditions of the sour veld, full advantage was taken to find out the maximal dose for the two-tooth sheep as well as for lambs (which latter hitherto had only been experimented with on a small scale).

The results were as follows:—

EXPERIMENT NO. 1—WITH SHEEP.

NOTE.—Half of each of the following lots were kept away from water a day previous to and a day after dosing ("not watered lot"). The others were driven to the water shortly after dosing, but they did not drink at the time ("watered lot").

RÉSUMÉ.

Ten sheep dosed with $7\frac{1}{2}$ gr. Cooper's dip + $7\frac{1}{2}$ gr. of bluestone. Result: None died.

Ten sheep dosed with $10\frac{1}{2}$ gr. of Cooper's dip + $10\frac{1}{2}$ gr. of bluestone. Result: None died.

One hundred and thirty-seven sheep, *two-tooth*, dosed with 10 gr. of Cooper's dip + 10 gr. of bluestone. Result: None died.

Ninety-two sheep, *two-tooth*, dosed with 12 gr. of Cooper's dip + 12 gr. of bluestone. Result: Four died.

Ten sheep, *two-tooth*, dosed with 15 gr. of Cooper's dip + 15 gr. of bluestone. Result: Three died.

Forty-nine sheep, four to eight tooth, dosed with 15 gr. of Cooper's dip + 15 gr. of bluestone. Result: None died.

CONCLUSIONS.

Under the conditions of the sour veld in the Stutterheim District, the dose of 15 gr. of Cooper's dip and 15 gr. of bluestone administered in a mixture proved to be safe for four eight-tooth sheep. The same dose, when given to two-tooth sheep, proved fatal to the extent of 30 per cent. The dose of 12 gr. of each proved fatal for four out of a number of ninety-two two-tooth sheep treated = 4.4 per cent. The dose of 10 gr. of each proved to be the *safe dose when given to 137 two-tooth sheep*. The two-tooth sheep decidedly proved to be the most susceptible, both in the "safe" and "unsafe" doses.

EXPERIMENT NO. 2—WITH LAMBS.

RÉSUMÉ.

The lambs referred to in Experiment No. 3 have also been included herein, as at the time of slaughter it could easily be seen that they would not have died as a result of dosing:—

Eight lambs over five months old dosed with 3 + 3 gr. Cooper's dip and bluestone. None died. Sixteen lambs over five months old dosed with 6 + 6 gr. Cooper's dip and bluestone. None died. Fifty-three lambs over five months old dosed with $7\frac{1}{2}$ + $7\frac{1}{2}$ gr. Cooper's dip and bluestone. None died. Ten lambs over five months old dosed with 9 + 9 gr. Cooper's dip and bluestone. One died = 10 per cent.

Result: The dose of 9 gr. of Cooper's dip and 9 gr. of bluestone proved to be fatal for one out of ten lambs = 10 per cent.

CONCLUSION.

The safe maximal dose of Cooper's dip and bluestone was found to be $7\frac{1}{2}$ gr. of each for a number of fifty-three lambs of five months old and above.

EXPERIMENT No. 3.

*To Ascertain the Smallest Effective Dose of a Mixture of
Cooper's Dip and Bluestone.*

Although the experiments to this effect are not yet complete, the results obtained in connection with the experiments under consideration are given hereunder.

It must by no means be concluded that the maximal dose of the mixture of bluestone and Cooper's dip is also the optimal one, *viz.*, the one which kills the greatest number of worms in the animals; there may be a smaller dose having the same or perhaps even a better effect. It is possible that the larger dose acts as an irritant on the mucosa of the stomach, whereby the drugs are not being properly dissolved and distributed throughout the stomach itself but are rapidly passed on to the small intestines. A smaller dose would be dissolved more rapidly and the drugs would then come in contact with the worms present.

To control the effect of the drug the experiment was undertaken in three different ways: (1) By killing some of the animals dosed. (2) By counting the worm eggs in the droppings of the animals before and after dosing. (3) By means of cultures,* *viz.*, the eggs were allowed to hatch in a glass tube. A few days after the collection of the droppings the various droppings were examined, and it could be ascertained if any decrease had taken place. (Method No. 3 served as a control to No. 2.)

(A) ANIMALS KILLED AFTER DOSING.

Result: Eight lambs whose bad condition was thought to be caused by wireworms were given doses of bluestone and Cooper's dip, varying in quantity from 3 gr. of each to 6 gr. of each, and were killed after dosing. The dose did not produce any appreciable lesions. The two lambs which had been dosed with the maximal dose of 6 gr. still contained a few wire worms in the stomach. It is remarkable that in all lambs *Æsophagostomum columbianum* (knopjes worm) were apparently not affected by dosing.

(B) OVA (EGGS) COUNTED BEFORE DOSING AND SHEEP KILLED
AFTERWARDS.

Results: Nine lambs whose droppings, on microscopical examination, showed ova were given doses of Cooper's dip and bluestone, varying from 3 gr. of each to 9 gr. of each. On *post-mortem* examination wireworms were found to be present in the lambs dosed with 3 gr. and in one lamb dosed with 7½ gr. Some lambs also showed infection with *Æsophagostomum columbianum* (knopjes worm).

* In a later report the life-history of the wire worm and the methods adopted to cultivate it will be given with more details.

(B) (I) CONTROLS.

Animals not Dosed and Killed.

Results: Of five control lambs which showed ova in the droppings and were killed without dosing, one showed no wire-worms on *post-mortem* examination; two showed them in very rare numbers and two showed them frequently and very frequently, respectively.

All five lambs were infected with either *Esophagostomum columbianum* or other round worms not yet identified.

(C) COUNTING OF OVA AND COMPARISON WITH CULTURES.

NOTE.—The method adopted was as follows:—

Counting of the Ova.—One part of the droppings was well mixed with fifty parts of water and a thin film was then spread over four glass sides. Of each slide fifty fields were examined microscopically (representing in all an area of about 2 square in.) and a count was made of the number of eggs present.

Cultivation of the Ova.—At the same time some droppings were placed in a culture tube to which water was added if the material became too dry; the tubes were examined later by the naked eye and the presence or frequency of the embryos (ensheathed) was recorded.

SUMMARY SHOWING THE EFFECT OF THE VARIOUS DOSES OF COOPER'S DIP AND BLUESTONE ON LAMBS.

Reference No	Condition of lamb	Microscopical examination of droppings before dosing	Dose of Cooper's dip and bluestone used		Interval between dosing and slaughter of lamb. Days	Remarks as to presence of <i>Strongylus contortus</i> in stomach on <i>post-mortem</i> examination
			Cooper's dip. Grains	Bluestone. Grains		
1	Poor ...	—	3	3	1	Nil.
2	" ...	—	3	3	1	Frequent.
9	" ...	Ova rare ...	3	3	3	Nil.
10	" ...	Ova present ...	3	3	3	"
11	Good ...	" ...	3	3	4	Rare.
12	Fair ...	" ...	3	3	4	Present.
3	Very poor	—	3	3	6	Nil.
4	Poor ...	—	3	3	6	"
5	" ...	—	6	6	1	"
6	" ...	—	6	6	1	Very rare.
13	" ...	Ova present ...	6	6	3	Nil.
14	" ...	Ova fairly frequent	6	6	3	"
7	Very poor	—	6	6	6	"
15	" ...	Ova very rare ...	7½	7½	3	"
16	Good ...	Ova present ...	7½	7½	4	Very rare.
17	Poor ...	" ...	9	9	3	Nil.
18	Fair ...	" ...	9	9	3	"
8	Ewe .. ("Bottle")	...	12	12	22 hours	Present.

Result: Smaller doses of Cooper's dip and bluestone than the maximal optimal does appear to be as effective for lambs as the maximal safe dose.

SUMMARY OF CONCLUSIONS.

The maximal safe dose for sheep of four to eight tooth under the conditions of the sour veld in Stutterheim District was found to be 15 gr. of Cooper's dip and 15 gr. of bluestone.

The maximal safe dose for sheep of two-tooth under the same conditions proved to be 10 gr. of Cooper's dip and 10 gr. of bluestone.

The maximal safe dose for lambs between five and nine months old under the same conditions proved to be $7\frac{1}{2}$ gr. of each.

Smaller doses than the maximal ones proved to be equally effective on the wireworms as the maximal safe dose. (This, however, requires further investigation on a much larger number of sheep and lambs.)

The mixture of Cooper's dip and bluestone, even in the maximal doses, does not expel all worms, although it reduces their number.

RECOMMENDATION.

As a medium dose the following can be recommended:—

Sheep of four to eight tooth: 10 gr. of Cooper's dip and 10 gr. of bluestone.

Sheep of two tooth: 7 gr. of Cooper's dip and 7 gr. of bluestone.

Lambs of six to nine months: 5 gr. of Cooper's dip and 5 gr. of bluestone.

(Full details of these experiments can be seen in the *Agricultural Journal of the Union of South Africa* for August, 1912.)

STRONGYLUS CLATHURTUS, BAIRD.

By S. N. MITTER, G.B.V.C.

. Lecturer on Pathology, Bengal Veterinary College.

(From the Raymond Research Laboratory, Calcutta, India.)

ABOUT forty-five years ago Dr. Baird described this parasite for the first time under the name of *Sclerostoma clatharatum* in the *Proceedings* of the Zoological Society of London. The nematodes were obtained from the stomach of an African elephant by Dr. Murie, who sent them to the British Museum. The elephant died in London in 1867. Thirteen years later Dr. T. Spencer Cobbold described the same parasite under the name of *Strongylus clathurtus*, Baird, in the *Transactions* of the Linnean Society of 1881. His material was obtained from an Indian

elephant, and was, he believed, all removed from the small intestines. In Dr. Murie's find the specimens except one were all females, but Dr. Cobbold's specimens were all males.

In India, Lieut.-Colonel Evans and Mr. Rennie described from Burmah in *Journal of Tropical Veterinary Science*, vol. v, No. II., an uncinaria (?) from the biliary duct of an Indian elephant, which, I believe, is identical to *Strongylus clathurtus*. This parasite is reported to be common there.

Lately I had an opportunity of studying two specimens (♂ and ♀) of this nematode removed from the biliary duct of an Indian elephant. Both of them were received in mutilated condition, and as my observation had been based on these two isolated specimens, it will necessarily lack in many histological details.

DESCRIPTION OF THE PARASITE.

The parasites were fairly large and of a dirty white colour, and striated transversely. The ♂ measured 45 mm. in length, and the ♀ 40 mm. The ♂ was narrowed in front and expanded behind; the ♀ tapered in front and behind. The head was small. The buccal capsule was deep, well defined and cup shaped, and surrounded by auricular folds. The cavity was furnished with a few spines and horny teeth. The œsophagus was rather long, well-developed, muscular, and dilated at its posterior extremity. This was followed by an intestine of an uniform calibre. The tail of the ♀ was moderately pointed, and slightly above it was noticed the anal pore. About midway between the cephalic and caudal extremity was found the situation of the genital pore. The uterus was big, highly convoluted, and extended from œsophagus down to the anal pore. The arrangement of the testicular tubes was noticed chiefly at the anterior half of the body. The caudal bursa was very prominent and markedly defined, and contained two anterior, one antero-lateral, two middle, one postero-lateral, and one posterior rays. Anterior ray is short, blunted, and double; antero-lateral simple, long, and straight; middle, large and double; postero-lateral, moderately long, slender, and simple; the posterior ray slightly notched at the extremity. The spicules were two in number and of equal length, and highly coloured. Each of them appeared to be moderately broad, membranous expansion around a strong shaft or mid-rib, the whole structure resembling a leaf.

A NOTE ON SOME INTERESTING RESULTS FOLLOWING THE INTERNAL ADMINISTRATION OF ARSENIC IN CANKER AND OTHER DISEASES OF THE FOOT IN HORSES.

By J. D. E. HOLMES, M.A., D.Sc., M.R.C.V.S.

Imperial Bacteriologist, Muktesar Laboratory.

WHILE carrying out experiments with arsenious oxide in the curative treatment of surra in horses I had an opportunity of observing the effects of arsenic in certain other pathological conditions, especially that of canker of the foot.

The value of arsenic in veterinary practice, as a general tonic, is well known, and it is occasionally given to improve the coat and condition of horses. In all our experiments with surra, which extended to three hundred or more ponies and horses, this tonic effect of arsenic was most marked. Animals in the last stage of emaciation rapidly regained their strength and condition.

In these cases arsenic was administered in full sub-toxic doses, commencing at about 1 grm. and gradually increasing to about 3 grm. Ten doses were given at an interval of one to two days between each dose. In some instances subcutaneous injections of atoxyl were given alternately with the arsenic by mouth.

A full description* of this method of treatment, by which we have cured many cases of surra in horses, has been previously published, and need not be further described here.

CANKER OF THE FOOT.

Among a number of country-bred ponies, purchased for experimental work, and which had been inoculated with surra and were under treatment with arsenic, one was observed to be suffering from canker of the off fore-foot. The disease was of long standing, the foot being deformed, the heels contracted, and the sole covered with a spongy fungoid growth from which a foul odour emanated. The foot was dressed occasionally with tar as an antiseptic, during the time that the pony was undergoing his course of arsenic treatment for surra. The pony had a relapse after the first course of arsenic and received a second course of treatment which resulted in a cure. In all he received twenty doses of arsenic in bolus. During the second course of

* *Parasitology*, vol. iii, pp. 73, 107. *Parasitology*, vol. iii, No. 3, October, 1910. *Journal of Tropical Veterinary Science* vol. ii, No. 1.

treatment, my attention was drawn to the improvement which had taken place in the diseased foot. The fungoid growth had entirely disappeared, and a firm and healthy tissue covered the sole and frog. By the time that the second course of treatment was completed the foot was to all appearance normal; no pain or tenderness was evinced when pressure was applied to the sole and frog and the pony was going sound. This animal was kept under observation for twelve months and the foot remained in a healthy condition. In order to ascertain how far in this case the disappearance of the disease was due to the administration of arsenic, I obtained at a later date three horses suffering from canker of the foot. Two were aged, country-bred horses from a Native Cavalry Regiment. The disease was of some two years' standing and all four feet were badly affected. The feet were long and club-shaped and the sole and frog had been completely replaced by fungoid growth, which bled on the slightest provocation. The horses were in pain and moved with difficulty on the toes of the feet. These two cases received three courses of arsenic and atoxyl during a period of six months. The doses were given on the same method as for the treatment of surra. Each course lasted about three weeks and consisted of five doses of arsenic in bolus and five subcutaneous injections of atoxyl. Between each course an interval of three to four weeks was allowed.

After the first course the condition of the feet showed a very marked improvement. The sole had assumed a healthy appearance; almost all the fungoid growth was gone and healthy tissue had taken its place.

After the second course of treatment the feet had returned to a quite normal condition. The disease had entirely disappeared, the sole was covered with hard and sound tissue and the frog and bars had grown into shape. The horses were able to put the feet to the ground without pain and walked sound. The whole structure of the feet appeared normal and healthy with the exception of a small area in the sole in the near hind of one horse and in the off hind of the other. This area, which was about the size of a shilling, was less firm than the surrounding parts and, on pressure, pain was evinced.

A third course of treatment followed, after which no trace of any disease of the feet could be detected. The horses were

kept under observation for twelve months. The feet remained healthy with the exception that in each case the area in the hind foot, which was the last to heal, again softened, and on cutting down it was found that a small amount of cankerous growth still remained.

These cases received no further treatment. The third horse was a waler from the Artillery. The off fore-foot was extensively diseased, the other three only to a slight extent. He was given two courses of treatment with arsenic and atoxyl. The same rapid improvement in the feet followed and in about two months it was impossible to detect any abnormality or disease of the feet. The horse was going sound and was returned to duty.

I was informed, however, that this horse was again attacked with canker of the foot in the following year.

In none of these cases was local treatment resorted to, beyond the application of tar or other antiseptic dressing to the diseased feet.

It has not been possible to make any further experiments on this subject as other cases of canker have not been procurable up to the present.

These four cases have, however, been sufficient to demonstrate that the internal administration of arsenic in large doses at spaced intervals, either alone or in combination with subcutaneous injections of atoxyl, produces a very rapid and remarkable improvement in cases of canker of the foot.

All lesions of the disease disappear, and healthy tissue takes the place of the fungoid growth. The sole and frog become hard and to all outward appearance healthy, and the animal goes sound and is fit for work. The experiments have not been sufficient to discover if a permanent cure of the disease can be obtained by this treatment. The combination of local treatment with the internal administration of arsenic would in all probability give more permanent results. The arsenic acts in the first place as a tonic and improves the general condition. It is also recognized that arsenic increases the proliferation of epithelial cells. The rapid formation of the new and healthy tissue, which gradually curtails and replaces the fungoid growth, is in response to this stimulus.

It is also possible that arsenic may have a direct action on the still unknown causal organism of canker.

THRUSH, SANDCRACK AND BRITTLE HOOF.

The same method of arsenic treatment has been tried with the most excellent results in other diseases of the feet, such as thrush, sandcrack, defective and brittle hoof, cracked heels, &c. In some cases the internal treatment alone has been relied on and in others it has been combined with local applications.

In all cases a rapid improvement and cure has resulted. With the combined treatment the results were somewhat more rapidly obtained.

One case I may mention of a young horse which was incapable of being worked owing to defective fore-feet. The wall of the foot was not more than from two and a half to three inches in length; the edges were frayed and fissured upwards from a half to one inch. The sole of the feet was thin and the horse walked with great difficulty and pain. The application of blisters to the coronets had been tried but failed to produce much improvement in the condition of the wall of the feet.

The horse was put under a course of arsenic. After the first course the growth of the wall had considerably increased and was of more healthy texture. Two further courses of arsenic were given within three months, at which time the feet had grown to a normal size and a dense wall had formed, which showed no tendency to brittleness. The horse was shod and went sound.

THE ABSORBENT ACTION OF ARSENIC ON MELANOTIC AND OTHER TUMOURS.

Another interesting observation regarding the action of arsenic was made during the experiments with surra.

One subject of these experiments was a mare which had been cast from the Army for melanotic tumours. These tumours varied in size from that of a marble to a cricket ball and were situated on the body, neck and thighs. The mare was inoculated with surra and received two courses of treatment with arsenic and atoxyl.

After the first course of treatment it was noticed that many of the smaller tumours had disappeared and by the time the second course was completed even the large tumours had entirely vanished. The mare was cured of surra and kept under observation for some eighteen months. About six months after the arsenic treatment the melanotic tumours again formed and were in a few months as large and numerous as before.

In order to test the absorbent power of arsenic on other tumours, I obtained two horses, one having a tumour on the inside of the off fetlock. This tumour had originated about twelve months previously from a bursati sore. The tumour at this time involved about three inches above and three below the fetlock joint, and was so large that it brushed against the opposite fetlock. It had been treated without improvement for several months. The horse was given three courses of arsenic and atoxyl during six months. Antiseptic dressings were applied to the tumour. No local treatment, except antiseptic dressings, was used. The tumour gradually became absorbed and by the expiration of six months it was completely removed, leaving a granulating surface of some three inches in diameter which eventually healed.

The other case was one of epithelioma involving the penis. The tumour was considerably larger than a cricket ball and it and part of the penis protruded from the sheath. The surface of the tumour was raw and ulcerated.

Antiseptic dressings were applied and the horse was placed on a course of internal treatment with arsenic.

Two courses of arsenic were given. The tumour decreased to about half its original dimensions. There was very marked proliferation of the surrounding normal tissue which in many places invaded and encapsulated parts of the tumour.

At this time the horse accidentally contracted tetanus and died.—*Bulletin* No. 32, Agricultural Research Institute, Pusa.

HUMANITY IN THE ABATTOIR.

By LOUDON M. DOUGLAS, F.R.S.E.

Edinburgh.

SOME little time ago a demonstration of humane methods in the slaughtering of cattle, sheep, and pigs, was carried out at the Edinburgh Abattoir, and resulted in directing widespread attention to the safety and ease with which humane slaughtering instruments can be used. These weapons of precision have been brought to their present state of perfection through the efforts of the Royal Society for the Prevention of Cruelty to Animals, of London, under whose auspices the Edinburgh and other demonstrations have been held.

It may be stated that the sale of these weapons is carried on by the Royal Society for the Prevention of Cruelty to Animals without any profit whatever, the cost price only being charged to users. The cost of the demonstrations is provided for otherwise. In this way the initial outlay to users is very small.

The weapons are of three kinds, viz., the humane killer, with long-arm attachment for cattle; the captive bolt pistol, for calves, sheep and pigs; and the spring bolt pistol. These several types have their advantages, the smaller weapons being particularly adapted for use with the smaller animals. The weapons have one feature in common, inasmuch as they produce instantaneous unconsciousness in the animals, by perforating the brain, which is the recorder of all sensations. The bleeding of the carcasses can then be proceeded with, without inflicting any pain whatever.

The great feature of these weapons is their simplicity. They supersede the pole-axe for cattle, and require no particular skill in handling. The pole-axe in the hands of an expert is a precise weapon, but experts require training, and as there are no means by which such training can be acquired, except by haphazard opportunities in the abattoirs, it is clear that the substitution of mechanical slaughtering weapons for the uncertain pole-axe is much to be desired. The result on the carcase is the same, and that is a great matter; the bleeding is not different in the one case from the other, and there is a great advantage in eliminating the element of bleeding during consciousness.

Hitherto very little has been done in connection with the stunning of the smaller animals used for food, owing very largely to the prejudice which exists in the minds of many meat purveyors, who cannot get away from the traditional practice. The same arguments apply to the smaller animals, however, as to cattle, and it has been shown over and over again that the work of slaughtering can be done quite as expeditiously and as well by the aid of the smaller weapons as by the traditional methods. The result on the carcasses is the same.

As has been mentioned, the Royal Society for the Prevention of Cruelty to Animals has given demonstrations at various abattoirs; it has been found that these have a high educational value, and they have shown in actual practice that the claims which are made for the humane weapons are justified.

It is proposed to continue these demonstrations in important

centres and, in pursuance of this policy, it has been arranged to give a demonstration at Salford abattoir on June 10 next, when the various weapons mentioned will be used.

The members of the Manchester and Salford Meat Traders' Association will be present, as well as many who are interested in the meat industries from counties adjoining Lancashire. Medical officers and veterinary inspectors will be invited, as well as representatives of the Manchester and Salford Municipalities.

The importance of this demonstration may be gathered from the fact that Salford is one of the largest live stock markets in England, as may be judged from the fact that during last financial year the numbers of animals which passed through it were: Cattle, 109,471; sheep, 614,725; calves, 7,510; pigs, 245.

The arrangements are under the charge of Mr. Councillor Fisher, Rillbank Terrace, Edinburgh, who arranged the many details in connection with the Edinburgh demonstration.

"ENCEPHALIC EMBOLIC STRONGYLOSIS" OR "ENCRANIAL STRONGYLGEMIC EMBOLISM"

By DR. BURTON R. ROGERS.

Veterinary Surgeon, Riley County, Kansas.

FOLLOWING a very extensive reading of the exhaustive work done on the human brain and its diseases, I am convinced the symptoms of the Kansas horse plague and the lesions so far as they were observed, coincide *exactly* in every way to embolism of certain terminal arteries of the brain. Every broad-minded and fair man who will deeply pursue this same literature cannot help agreeing with this fact.

The extraordinarily ideal conditions of climate favourable at the right time for the preservation and perpetuation of certain stages of the *Strongylus armatus* resulted in an unusually large number of their larvæ in the intestinal tracts of the horses in the infested districts. This in turn means a proportionately large number entering the submucosa and subserosa for the encystment stage. This in turn is followed by proportionately greater numbers following their well-known perverse habit of burrowing up the loose great mesentery and burrowing into the wall of the tough great anterior mesenteric artery, and other vessels,

increase their opportunities to enter the lumen of the vessels and into the free stream.

This does not state or even imply that other causes cannot or do not produce exactly the same symptoms also. It merely serves to broaden the thought and increase the channels.

The moment the parasite enters the liquid of an artery, vein or lacteal it fulfils the definition and is an embolus.

There are *eighteen* different vessels by which they may enter the cranial cavity, and just *one* parasite, no matter whether it is one out of thousands or one out of less than ten, when in the right place is enough to produce embolism of the brain.

If the above two conditions or facts co-existed, it is plain and as accurate and positive as 2 plus 2 is 4, and it would be absolutely impossible for anything but that disease to follow.

This does not state or even imply that other causes may not produce the emboli, such as bacterial agglutination, bacteria, moulds, toxins, clots, &c.

I am told the King of Italy once knighted a man in the nineties who had "discovered" the *Bacillus icteroides* to be the cause of yellow fever. But a few years later it took the risk and loss of the lives of Reed, Carrol, and Lazear to prove that he was *wrong*, and that the absolutely *necessary factor* was the mosquito.

Volumes and volumes of "scientific" material were written upon yellow fever and an indefinite "miasma." But one correct sentence regarding the mosquito and yellow fever is worth more than all the volumes and records of previous research and theory.

If gold is on the east side of a river and none on the west, a thousand men digging and searching on the west will *never* find the gold, but one man not even looking for it could accidentally tumble upon it on the east. And so the search for the cause of disease, the river or dividing line between plant and animal life may be important enough to stampede across.

We now enclose "miasma" which no one ever saw in quotation marks, and I am confident that some of the causes, including "mould" in connection with the Kansas horse plague, will some day be similarly written.

Inasmuch as the positive essential specific cause of the recent Kansas horse plague has not thus far been satisfactorily demonstrated to all, and therefore not entirely agreed upon, the field

is still open for the study and consideration by all broad-minded scientific veterinarians and others of all the plausible and well grounded theories.

One or more of the theories already presented is probably correct. If not, however, one of them or a combination of them may lead to work that will ultimately solve the problem. For every "why" in Nature, there is a "reason."

After extensive reading and thought along certain lines during the past few months, I am convinced the *Strongylus armatus* is the most destructive enemy extant of the farm horse in certain climates and seasons—but for reasons that have not been given heretofore or suspected even.

Still my theory was and is based upon observed facts in connection with the outbreak, together with scattered and *unconnected* but *recorded facts* in anatomy, biology, and pathology. I do not ask anyone to agree with the theory I evolved from these observations and facts. All I ask is that the facts be considered and the theory be eliminated only by further investigation and experiment—and not by *opinion* alone.

I venture to say without fear of contradiction that there does not or never did exist an expert veterinary neurologist. Neither does there exist a veterinarian who is an expert specialist and sole investigator of helminthology. Outside of the anatomy lecturers, there are very few men who know both surgical and medicinal veterinary anatomy, or rather exact anatomy, or who can see the blood-vessels and the circulating medium with an X-ray eye. I am sure there is no veterinarian who combines all these fields as a joint specialist. Yet I firmly believe the cause of this disease will be worked out by combining and interlocking existing knowledge within these three fields of science, together with a slight additional knowledge that will come from future research.

NEUROLOGICAL FACTS.

(1) In the cranial cavity are nuclei or nerve centres or collections of nerve-cell bodies in certain masses or areas, that have specific definite control over certain functions of the entire body. The most vital centres are located in the medulla oblongata. The respiratory centre, the vasomotor centre, the cardiac centre, the *deglutition* centre, the urination centre, and the centres or nerve-cell bodies of the last eight cranial nerves, together with

the trophic or nutritional nerves of all the above, are all located in the medulla. In addition to this, the nerve-fibres or tracts from every other centre in the brain pass *through* and become a part of the medulla as they pass out of the cranial cavity to their ultimate destination.

(2) Blood (together with whatever foreign matter or bodies it may carry in solution or suspension) can enter the cranial cavity by eighteen different vessels, or nine pairs, as follows: internal carotids, vertebrals, occipitals, middle spinal, ophthalmics, mastoids, speno-spinous or great meningeals, and two branches of the prevertebrals. The last five pairs supply the meninges. The first four enter the circle of Willis at the base of the brain. In the human brain (and probably quite similarly in the horse) eighteen named pairs of intrinsic *terminal* arteries pass up from the circle of Willis and from the basilar artery to supply isolated and definite areas of the brain and of the medulla.

(3) A terminal or end artery is an artery supplying a certain definite cone-shaped or wedge-shaped or tree-shaped area, and has absolutely *no anastomosis* of any kind with any other artery. Therefore it is the *only* artery supplying that particular area with nutrition and life.

(4) Terminal arteries are found in the kidneys, in the spleen, in the lungs, and in the *brain*, the last being the most delicate and important organ of all.

(5) When a terminal artery is ligatured or plugged or occluded in *any* way, the blood supply and nutrition of that part of the wedge-shaped areas is cut off, and the function of it is impaired or *destroyed*, and an infarct is produced. Conversely, terminal arteries are found wherever infarcts are found. Infarcts may be anæmic or hæmorrhagic, sterile or infected.

(6) An embolus is *any* foreign body of *any* kind, animate or inanimate, suspended in and floating free in the blood-stream and in *any* blood-vessel. (Therefore it may be a parasite in any stage.)

When an embolus reaches an artery or arteriole smaller than itself, it completely or incompletely occludes and plugs that artery. Its presence may irritate the surrounding tunica intima and complete the occlusion by thrombus formation. The degree of damage depends, *first*, upon the kind and importance of the

tissue supplied by the artery, and *second*, upon whether the embolus was sterile or infected with pathogenic organisms.

Plugging an inosculating or anastomosing artery is of little consequence, as its companion arteries soon compensate for its function. But if a *terminal* artery is plugged, impaired nutrition and function and ultimate destruction rapidly occur. If a terminal artery of the spleen, kidney, or lungs is plugged, it is also comparatively inconsequential, for an animal can live after the spleen has been removed, and it can get along with less than one kidney, and with less than one lung. Parts of the brain, and particularly the cerebrum, have been congenitally absent, or may have been extirpated surgically, or destroyed pathologically, and the person still live.

But there are certain parts of the brain, particularly the medulla, supplied from the basilar artery by *terminal* arteries, emboli and plugging of which produce sudden, serious, profound disturbances of wide extent and variations, yet symptomatically uniform within certain limits.

Sterile emboli mechanically injure—but if they are in addition also infected, the degree of damage is much greater when pathogenic or even saprophytic bacteria are brought to the injured area. Nature's forces are impaired. Many surgeons prior to an operation give their patient a pre-operative bacterin treatment, so as to fortify and help Nature to help the surgically injured area to overcome possible infection. Therefore injury due to emboli and infection *bacterins* are positively indicated.

(7) Human researches record the symptoms of brain embolism in the medulla as including the following: (1) Inability to swallow, ninth cranial. (2) Impaired speech, twelfth cranial; grinding teeth, fifth unopposed by seventh. (4) Paralysis of facial muscles, seventh cranial; dizziness and impaired hearing; eighth cranial; irregular pulse, cardiac, vagus, and vasomotor centres. (7) Retention of urine. (8) Hemiplegia and tendency to fall in one direction or to go in a circle. The last may follow emboli farther up in cortex and motor areas of the cerebrum and cerebellum.

HELMINTHOLOGICAL FACTS.

(1) Zoologically, worms and insects are closely related, differing mainly in insects having articulated limbs, while the vermes have none.

Certain insects are known to be the hosts and the carriers and the necessary factors in the causation of certain diseases.

Worms are divided into platyhelminthes or flat worms, and nemathelminthes or round worms. The flat worms are flat, are hermaphroditic, having both sexes in the same individual, and they have *no digestive tract*. The food passing through their integument is probably as sterile as the food passing through our intestinal mucosa into the submucosa for absorption.

Round worms are cylindrical; they have separate sexes, therefore males and females; but above all, they *have a distinct digestive tract*. Their digestive tracts probably contain a bacterial and protozoitic flora as varied as that of the intestinal tract of the animal they inhabit.

(2) Nematodes or round worms are divided into five families, three of which, the Filaridæ, the Ascaridæ, and the Oxyuridæ, are *not* blood-suckers in the adult stage, and whose larvæ *do not* burrow out from the intestines into the tissues, and are therefore comparatively harmless.

The other two families, the Strongylidæ and the Trichotache-lidæ, *are* blood-suckers when adult, and their larvæ *do* migrate from the intestines and *do burrow* into the various tissues and current vessels, and are thus damaging and dangerous. In my estimation they are much more damaging and injurious and devastating than has ever been suspected, and in ways that have never been thought of.

(3) The Strongylidæ family includes the famous hook-worm of the South and the Tropics, and only recently recognized as destructive; it includes also the gape-worm of chickens, the *Strongylus paradoxus* of hogs, the hook-worm of the dog, the stomach or wire-worm of the sheep or ox, and the *Strongylus armatus* and *Sclerostoma tetracanthum* of the horse.

(4) In each of the above hosts there are one or more incompletely understood diseases, all fundamentally alike, and all nervous in character.

In man there is cerebrospinal meningitis, infantile paralysis, pellagra, together with certain forms of insanity, epilepsy, blindness, loss of speech, loss of hearing, apoplexy, &c., and "infectious anæmia." In chickens there is apoplectiform septicæmia and limber neck; in hogs there is hog cholera, swine plague, and paraplegia; in dogs there is rabies of the acute, violent, and

dumb types; in cattle there is so-called cornstalk disease. In horses there is cerebrospinal meningitis, cerebritis, leuco-encephalitis, blind-staggers, stomach-staggers, forage poisoning, "mould" poisoning, smelter-fumes poisoning, loco disease, Borna's disease, some forms of influenza, and a host of others. Besides these, there is swamp fever and infectious anæmia, the effects of the adult worm sucking blood.

Helminths belonging to the same zoological family must be quite similar, within certain limits, in their biological features. Facts have been worked out concerning some that have not been in others. It is fair to assume similarities because of the family.

Males and females copulate. Thousands of eggs are produced. The eggs are usually passed out with the fæces after being passed out by the female into the intestinal tract of the host. They usually do not hatch until they reach the exterior.

(5) According to the 1908 B.A.I. Report (page 270), the adult females of the *Strongylus contortus* do produce thousands of microscopic eggs that pass out unhatched with the fæces of the sheep. In a few hours even, or days or weeks—depending upon temperature and moisture—the eggs hatch into tiny embryos and undergo development. Drying and freezing will kill both eggs and embryos. The embryos (also of liver flukes) crawl up moist grass blades, when the humidity is sufficient and the temperature above 40 degrees Fahrenheit, and encyst on the grass. Conditions known to favour "mould" formation are also just as positively optimum for the out-of-the-host- or out-of-doors-stage of helminths.

(6) The cysts are taken in on the grass blades or "forage" by sheep.

(7) More water than the highest degree of humidity will destroy the egg stage of the human hook-worm. Rain must therefore be detrimental.

(8) The larvæ of the human hook-worm are said to pass through the soles of the feet, then enter the circulation (if so, they positively become emboli) and reach the lung (may they not reach other organs?), and are coughed up from the lungs and swallowed, and in this way reach the intestines. Personally, I do not believe that is correct. I believe contaminated vegetation or water is the channel and vehicle.

(9) It is classical knowledge that one stage of the liver

flake passes through the body of the snail as an intermediate host. One stage of the *Echinorhynchus gigas* passes through the grub-worm. The earth-worm is said to be the intermediate host of the gape-worm.

(10) The *Trichina spiralis*, belonging to the Trichotrachelidæ family, passes no essential part of its life cycle outside of the animal body or animal tissues. The encysted larvæ are taken into the intestinal tract, where they rapidly develop into adult males and females, which immediately copulate. The male dies. The females stick their heads in the crypts of Lieberkuhn, suck blood, and in a short time hatch out about 1,500 living embryos or larvæ each.

There are no eggs passed out by the adult female Trichinæ, or with the fæces of the host. The larvæ immediately burrow through the mucosa into the submucosa and subserosa and enter the lacteals and veins.

(11) A large number of parasites, whether brought forth as living young from their mothers into the intestinal tract of the host, or whether taken in in the form of eggs or other form of encystment, and then become larvæ or embryos, *do* burrow through the mucosa into the submucosa and subserosa and thence into the lacteals and circulation.

This is true of the *Trichina spiralis*, the *Echinococcus*, the *Cysticercus cellulosæ*, the *C. bovis*, *Cœnurus cerebralis*, the gape-worm, the *Esophagostoma columbiana*, the *Strongylus armatus*, and *Sclerostoma tetracanthum*, and the human hook-worm.

(12) Sometimes the proglottides or ripe segments or eggs of the *Tænia solium* and *T. saginata* of man may, by retrograde peristalsis, pass backwards from the large intestines back into the small intestines, and even back to the stomach. The intestinal and gastric juices then dissolve the shell and hatch the embryo in exactly the same way the hog or ox would have done. The embryos then pass into the submucosa of man, and by the circulation may reach any part of the body, particularly the brain, and encyst in the larval form. It is auto-infection.

INTERPOSED ANATOMICAL FACTS.

(1) The small intestines of the horse are about 72 ft. in length and the large about 25 ft. You know this; but stop and realize it in connection with this problem. The mesentery

that suspends the intestines to the sub-lumbar region is a *huge* triangle having a base between 70 and 100 ft. in length, and an apex around the tough, thick-walled great anterior mesenteric artery. More important yet to consider in this important apex is the thin-walled portal vein formed by the union of all the veins coming from the 100 ft. of intestines at the base of the triangle. There is also the extremely thin-walled receptaculum chyli, formed mainly by the union of the myriads of lacteals that come from this same 100 ft. at the base of the triangle. There is also the important semi-lunar ganglion or *abdominal brain*, containing most of the cell-bodies of the myriads of sympathetic sensory nerves coming from the intestinal mucosa, and also most of the cell-bodies of the myriads of motor, secretory, and trophic fibres of the solar plexus going to the intestines to control peristalsis, secretion, and nutrition. The thin-walled posterior vena cava is also placed at this important apex. All literature confines itself to the less important thick-walled anterior mesenteric artery, and very little attention is called to the other more important centripetal structures.

(2) The two peritoneal layers of the mesentery are united very closely by loose, soft, easily penetrable areolar tissue. The two layers are also quite widely separated at the line where they envelop and suspend, or are attached to the concave side of the bowels' upper surface. This is therefore an extremely favourable place for the vermicular burrowing of the larvæ and embryos of parasites, and they may quickly reach the important apex. They may also enter the walls or the lumen itself of the arteries or the centripetal veins and lacteals. The blood in the mesenteric arteries is centrifugal and goes *to* the intestines. The blood in the mesenteric veins and the lymph in the lacteals is centripetal and going *away* from the intestines *to* the apex in the sub-lumbar region. The receptaculum chyli, by means of the thoracic duct, empties directly into the lower part of the jugular vein and anterior vena cava, and no lymph nodes are interposed. The anterior and posterior venæ cavæ empty directly into the right auricle of the heart. The blood of the portal vein must pass through the capillaries of the liver first before it empties into the posterior vena cava. From the right side of the heart all this material must pass through the capillaries of the lungs. The lung has terminal arteries, but elastic ones. The blood is carried

back to the heart from the lungs. The blood and whatever it may contain is sent by the heart to *any* part of the body.

The blood of the vena cava and the lymph of the receptaculum chyli, together with whatever emboli they may contain, pass through only *one* set of capillaries, namely, of the elastic lungs, before they reach the common aorta or beginning of the great systemic circulation, the blood of the portal circulation having to pass through the capillaries of the liver in addition.

(3) The venous blood from the entire nasal chamber, and all of the venous blood from the hard palate and from the soft palate, and part of that from the tongue, and part from the face, and all that from the eye and eyeball, *must* pass through the *cranial* cavity by means of the ophthalmic vein at the alveolar tuberosity and orbital hiatus. The ophthalmic vein enters the ophthalmic foramen into the cranial cavity and joins the cavernous and sub-sphenoidal venous sinuses. Therefore inflammation of the brain and meninges, bringing about increased fluid and exudation, results in pressure upon this vein, and passive congestion follows in the tissues of the drained areas.

Additional Helminthological Facts.

(13) The immature form of the *Strongylus armatus* is very commonly found in the intestinal tract of the horse. Between the egg stage and the adult stage it is self-evident that there is a time when it is the exact size of the so-called adult stage of a parasite that has been described and called the "*Sclerostoma tetracanthum*." There is some question as to whether such a parasite actually exists, and that the larval form of the *S. armatus* has been erroneously thought to be, and described as a distinct species. There is absolutely no question that because the larval stage of the *S. armatus* is at some time and stage exactly equal in size and appearance to the so-called or described *Sclerostoma tetracanthum*, that this mistake has been often and repeatedly and unconsciously made by practitioners and others, "experts" sometimes.

Even if there are seventeen or more species of these found in the intestines of the horse, and their larval habits the same as given below, the results would be the same.

(14) The *S. armatus* (and the *tetracanthus* as well) *does* enter the submucosa and subserosa. It also *does* burrow into the

tough wall of the anterior mesenteric artery and other arteries. It also passes through the walls of the artery and sticks free into the lumen. Does it ever let loose and get into the bloodstream?—Yes, most emphatically, yes.

(15) Neumann's 1892 edition of "*Animal Parasites*" records the larvæ of the *Strongylus armatus* as having been found in the following places: the intestinal lumen, the intestinal walls, the mesenteric, coeliac axis, spermatic and renal arteries, and the aorta, in the peritoneal cavity, in the muscular and connective tissues, in the liver, in the lungs, in the kidneys, in the scrotal sac, in the cryptorchid testicle, and in the *brain*. The cases he records where it was found in the brain showed symptoms exactly similar to those in the Kansas horse plague. No one can afford to neglect to read that paragraph on p. 727. I myself have seen in a dissecting subject an aneurism at the termination of the common carotid artery, and the internal carotid completely occluded. These are positive evidences and proof of the wandering character of strongyles. The commonness of the parasite in the intestines and mesenteric arteries is no proof against its occasional presence and seriousness in the brain.

Dr. James Law says, on p. 5, vol. v.: "Given a real parasite with injurious qualities, the aggregation of a large number of the animals forming its natural host, and an *environment especially favourable to its preservation* and propagation, we must be prepared to meet with an extensive, dangerous, and destructive outbreak of which no previous counterpart is known. No previous immunity, and no history of this parasite showing an *apparent harmlessness*, must be allowed to *blind us*."

KANSAS EPIDEMIOLOGICAL OBSERVATION FACTS.

Observation Fact (1) In the infested territory there *was* a period of very hot, muggy, humid weather, favourable to crops of all kinds, and particularly to "moulds" and the atmospheric egg and embryonic stage of parasitic worms.

(2) An extraordinarily large number and grand total of the infestuous stage survived in the pastures (*on the grass (?)*, forage (?), or *in the water (?)*).

(3) A correspondingly greater grand total were ingested.

(4) It followed that an extraordinarily greater grand total of the larvæ of the *S. armatus* were found in the intestinal tracts of both the healthy and sick horses in the infested districts.

(5) A correspondingly greater grand total naturally entered the submucosa and subserosa.

(6) A correspondingly greater number and grand total entered the tough, thick anterior mesenteric artery walls.

(7) A correspondingly greater grand total could, and no doubt *did*, enter the lumen of the thin-walled centripetal veins and lacteals.

(8) The larvæ of the *S. armatus* were positively found in the withdrawn blood by several investigators.

(9) A correspondingly greater increase in the grand total of larvæ in the blood-streams of the horses in the infested districts means the correspondingly greater increase of the grand total of *emboli*.

(10) A correspondingly greater grand total reached the *terminal* or end-arteries of the lungs and kidneys, impairing correspondingly greater numbers of small areas of the lungs and kidneys. (The pneumonias and nephrities were common and influenzal symptoms also.)

(11) The increased grand total in the blood and in the lungs increased the opportunities for a greater grand total vermicularly, working their way through and stretching the elastic capillaries of the lungs into the veins and thence to the common aorta.

(12) Correspondingly greater grand totals in the common aorta increase the opportunities for one or more *larval emboli* to reach the cranial cavity by any one of the eighteen branches entering it.

(13) All of the horses showed positive symptoms of *brain embolism*.

(14) Many of the horses showed symptoms of pneumonia and nephritis.

(15) A diplococcus or streptococcus, or pasteurella or pneumococcus, was found in the cerebro-spinal fluid and urine and other fluids in some of the cases by some of the investigators.

(15a) If one would take a handful of the intestinal contents from the horse, dissolve in water, and then plate it out in the form of a culture medium; then take pure colonies, and inject them into the cerebro-spinal fluids, or possibly into the jugular, they might be able to produce meningitis from several of the colonies, for there are several kinds of infectious meningitis.

(16) The intestinal tract of the equine host, and therefore

the intestinal tract of the adult and larval *Strongylus*, is *not* sterile, but has a flora.

(17) Combine Neurological Fact 6, Helminthological Fact 1, Observation Fact 12, Observation Facts 13, 14, 15 and 16.

(18) In most cases there *was* paralysis of the intestines and no peristalsis. Could the larvæ have burrowed into the semilunar ganglia of the solar plexus and, irritating the nerve-cell bodies, impair their function?

(19) In many cases there were symptoms of compression of the ophthalmic vein, and congestion of the eyes, mouth, and face. (Anatomical Fact 3.—Influenzal symptoms.)

(20) There was inability to swallow, and paralysis of the deglutition centre. (See Neurological Fact 7.)

(21) There was often paralysis of the facial muscles, seventh cranial.

(22) There *was* grinding of the teeth. The fifth nerve, closing the jaw, was unopposed by the paralysed seventh that opens the jaws.

(23) Animals turned or leaned to one side, or forward or backward, showing evidence of paralysis of muscle groups—hemiplegia.

(24) Hundreds of lines of treatment were adopted, and many kinds were advocated in the public press.

(25) Very prominent among the lines of treatment advocated was vermicial, vermifugal, purgative, and laxative treatment.

(26) The first two official reports given out from the Livestock Commissioner's office advocated vermifuges. The same was copied by hundreds of papers and read by thousands. The *Topeka Capital*, and the *Farmers' Mail and Breeze*, and the *Kansas Farmer* advocated super-heroic doses of aloes (1 oz.), and copperas in addition.

(27) As a result of the above, thousands of doses of worm drugs and vermifuges and cathartics were administered to healthy horses.

(28) As a result of the above, millions of the larvæ of the *S. armatus* were removed from the intestinal tracts of the horses in the infested district, and the dangerous grand total decreased.

(29) As an additional result of the doses of vermifuges, all the good ones being also good purgatives, the total quantity of ingested poison was reduced, whether it was germs, moulds, chemicals, toxins, or *worms*.

(29a) Many of the horses that were said to have died from mechanical pneumonia due to drugging had the cause of the pneumonia in multiple pulmonary emboli and infarcts instead.

(30) Thousands of horses were removed from the pastures during the right period, and thus reduced the quantity of poison ingested. There is no proof that this removal was not from worms as well as other poisons.

(31) The infested territory was blessed with a good rain and drop in temperature. (See Helminthological Fact 7.)

(32) No excessively and prolonged humid atmosphere followed.

(33) The disease abated, and is practically gone now.

UNANSWERED QUESTIONS TO BE SOLVED.

Question 1.—Has the complete life history of the *S. armatus* been thoroughly and accurately worked out, or merely theorized out in parts?

Q. 2.—Do the *Strongylus* eggs ever hatch in intestinal tract of the host?

Q. 3.—What time of the year are the greatest number of eggs passed out?

Q. 4.—What are the optimum soil, atmospheric, temperature, moisture, and forage conditions most favourable to the preservation and perpetuation of the greatest numbers of the *S. armatus*?

Q. 5.—Have the Weather Bureau records been consulted and considered and compared prior to and during outbreaks of cerebro-spinal meningitis and the other epidemics of the horse and other animals?

Q. 6.—Does the *S. armatus* require an intermediate host?

Q. 7.—If an intermediate host is required, what is it, and what are the optimum conditions favourable to it?

Q. 8.—Are the eggs in the infestious stage for other or the same horse *immediately* after being passed out?

Q. 9.—Do the eggs hatch out of doors—in the manure, soil, or water?

Q. 10.—How soon after being passed out do the eggs hatch and the worm reach the *infestious* stage?

Q. 11.—When they *do* reach the infestious stage, is it *in* the water, *on* the grass or forage—or where?

Q. 12.—Is the infestious stage in the pasture microscopic or macroscopic?

Q. 13.—How soon after being ingested in the infestious stage by the horses are they hatched or developed to the pathogenic stage?

Q. 14.—How large is the hatched embryo or larva?

Q. 15.—How large is the embryo or larva when it is first ready to and does burrow through the mucosa?

Q. 16.—What is the anatomical and physiological character of its burrowing apparatus and its possibilities?

Q. 17.—How large are the embryos or larvæ when they become *emboli*, or may they vary?

Q. 18.—Being elongated and animate when they reach the capillaries, can they elongate and attenuate themselves, and stretch the capillaries and pass beyond into the larger venules, particularly in the lungs?

Q. 19.—Can they do this in the terminal arteries of the brain, and soon enough before destruction of tissue and recovery occur?

Q. 20.—When caught in a capillary, can they burrow out through the wall into the tissues and thence into a larger vessel?

Q. 21.—When caught in an artery, can the larvæ be attacked and destroyed by leucocytes?

Q. 22.—Will coiled up larvæ occlude larger vessels than when straight?

Q. 23.—Can the larvæ carry bacteria, protozoa, &c., from the intestines of the horse to any part of the body by means of its own digestive tract?

Q. 24.—Can the adult female of the *S. armatus* be oviparous in the summer and viviparous, like the *Trichina spiralis* and other vermes, in the winter? This based on atavistic principles of the evolution of family.

Q. 25.—Would not such larvæ, hatched in the intestinal tract, burrow into the tissues like the *T. spiralis* and summer strongyle?

Q. 26.—When horses are fed on poor, innutritious food, or mouldy corn and stocks in the winter, can retrograde peristalsis force the eggs back into the intestines or stomach in immense numbers and then hatch them into larvæ?

Q. 27.—Or can the adult female, ripe and ready to hatch her eggs, be passed back into the stomach and intestines, and then hatching, bring about *auto-infection* with larvæ or eggs in the dead of winter?

Q. 28.—Does poor innutritious food and constipation force

the female to migrate for better food back into the more anterior parts of the digestive tract? (See *H.F.* 12.)

Q. 29.—Were the general rains all over Kansas and the infested territory about September 18 destructive to the eggs or larvæ and the infestious stage, and does this explain and account for the disease subsiding?

Q. 30.—Is anyone in a position to say under oath, based on sufficient investigation, that the removal of the horses from the pastures did not remove them from the infestious stage, from a probable positive infestious stage of a destructive worm, as well as from a "possible" mould, chemical or bacterial poison?

Q. 31.—Until the specific destructive agent and its method of pathogenicity has been positively proven, can anyone say it was *not* the *S. armatus*?

Q. 32.—Is there anyone in a position to say that the opinion and advice regarding worms, and their methods of elimination and prevention, that was published broadcast, and that was followed by the administration of thousands of doses of effective worm medicines that were also good purges for healthy horses, *was not the GREATEST of ALL the factors in reducing the deaths?*

Q. 33.—Can anyone deny that such advice and its practice did remove and decrease the total quantity of poison, whether chemical, mould, or germ?

Q. 34.—Was the proper technique carried out by anyone to determine whether the larvæ had become encephalic emboli?—No; positively *no*, so far as I know.

Q. 35.—*What is the proper technique that ought to be adopted to determine the presence or absence of encephalic larval emboli? That is the principal object of this paper.*

By the time I had evolved my theory, and by reading had confirmed it, and had worked up a technique that might prove it, it was too late, and conditions arose that made it impossible for me to do so.

In the past we have *overlooked* this etiological theory because it did not exist as a theory, but any veterinarian or scientist in the public service anywhere, who reads this and the literature upon brain embolism of the human, will probably not *ignore* it in the future until disproved. Should the disease ever become epidemic or endemic anywhere again, I trust those who have the inclination, time, funds, and liberty to do so, will make observa-

tions and conduct proper investigations so as to determine the positive facts.

I suggest that first of all the blood of the moribund be drawn into a sodium fluoride or sodium citrate or potassium oxalate solution so as to prevent clotting and enmeshing the larvæ, and then strain it through cloth to determine the possible presence of larvæ in the free blood at that particular moment as circumstantial evidence.

Secondly.—After bleeding expose both common carotid arteries immediately after death, and inject toward the head a coloured fine injection mass mixed with formaldehyde and glycerine.

Then remove the brain very carefully by removing the *floor first*, and thus preserve all the vessels that enter at the base.

Never remove the roof first, and then pull out the brain, rupturing the vessels passing through the foramina at the base. This suggests an additional question: How many brains were removed, and of these was a single one removed by taking the base off first?

It might be well to precede the injection with a washing out of all the cephalic vessels with a normal salt solution. Afterwards follow each artery and twig until a place or places are found where the injection material stopped and did not go beyond. Examine this point carefully in the *interior* of the vessel for an embolism.

I suggest that a very careful clinical study, note, and record be made of the symptoms before death just exactly as an expert human neurologist would do. They can locate the exact spot of most brain lesions before death. If my theory is correct we may often be able to prophesy the same from the symptoms.

Experience may suggest improvements in the technique.

There is an opportunity here for a great work for the horse and humanity that may lead to lines of work that may solve the mysteries the investigators admit surround the sources of infection and the methods of transmission of human cerebrospinal meningitis, infantile paralysis, pellagra, rabies, and some other diseases, and thus be the means of *saving thousands of human lives*.

Whether I am right or wrong, I maintain this is sufficient defence for the writing of this article.

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[In our next issue we shall publish a criticism of Dr. Burton Rogers's article by Professor James Law, F.R.C.V.S.—Ed., V. J.]

 ROYAL COLLEGE OF VETERINARY SURGEONS.

FELLOWSHIP DEGREE.

A MEETING of the Board of Examiners for the Fellowship Degree was held at the College, 10, Red Lion Square, W.C., on Saturday, May 17. The following is a list of the successful candidates, together with the titles of their respective theses:—

Alexander Crabb, "The Veterinary Surgeon and his relation to the Refrigerated Meat Supply."

Wm. Lancelot Little, "Periodontal Disease of Horses."

J. R. Hodgkins, "Rinderpest in India."

W. Ashe King, "Foot-and-mouth Disease."

The Examiners were Messrs. J. Malcolm, W. Hunting, and Professor J. Macqueen; Mr. W. J. Mulvey being in the chair.

 PERSONAL.

MR. ARTHUR DUNBAR MORGAN, M.R.C.V.S., D.V.H., has been appointed Assistant Veterinary Officer to the City of Sheffield.

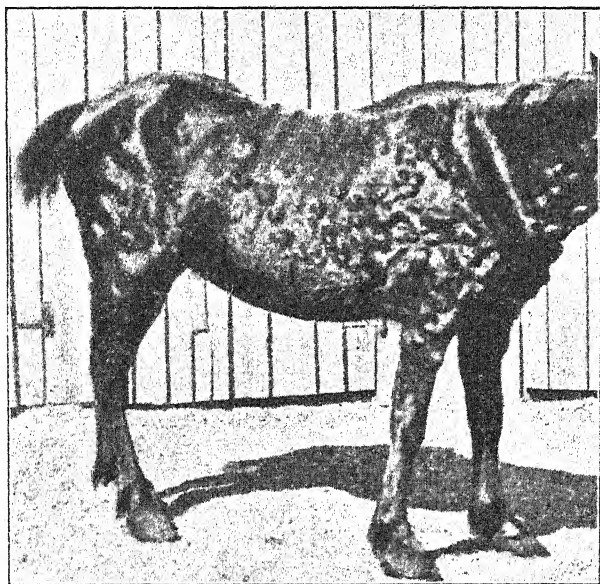
Clinical Articles.

LYMPHADENITIS AND MULTIPLE CUTANEOUS TUMOURS IN A HORSE.

By A. KRAGERUD.

THE horse illustrated, with the numerous nodules of the lymphatics, presented the following appearances:—

The affection on superficial examination had a similarity to glanders. The horse was covered all over with a number of round nodules, partly arranged in ranks, of the size of a hazel nut to a walnut. There was a greyish serous discharge from both nostrils, and on the wall of the nostrils little round raw surfaces. The



appetite of the animal was good; there was no fever, and the general condition was unaffected. On *post-mortem* the raw surfaces, somewhat inflamed, were seen on the nasal mucosa. All the lymphatic glands of the body were swollen. There were no other anatomical changes. This disease commenced three years previously, according to the owner. At this time it had been treated for slight strangles by a veterinary surgeon. Then

some little nodules formed under the skin; these increased from time to time in number and size, and for about a year there had been nasal discharge. During the last three months the nodules and discharge had both increased considerably. Apparently a lymphadenitis was present.—*Deutsche tierärztl. Woch.*

SARCOMA OF THE STOMACH IN THE HORSE.

BY CHIEF VETERINARY-SURGEON MULLAUER.

A SEVENTEEN-YEAR-OLD service horse, called "Nichte," of the 4th Squadron of the 2nd Regiment of Hanover Dragoons, which was always a good eater and had done good service, was reduced during last year almost to a skelton, finally refused all food, and became dull and apathetic. Different cures were tried without effect, and even after eating well occasionally no improvement occurred.

The horse was cast from the regiment and slaughtered at the Lüneburg abattoir.

On *post-mortem*, as a cause of the disease, a pathological degeneration of the stomach was revealed.

This organ was about half as big again as normal and showed externally elevations as large as a child's fist between which deep incarcerations were present. On pressure it was hard in some places and fluctuated in others.

On opening the stomach at the great curvature a litre of yellowish-white thick pus escaped which had no smell; after its removal the cut surface of the stomach wall showed a fatty greyish-yellow appearance. The walls of the stomach were thickened and its lumen obliterated. From the thickened walls numerous fistulous openings containing pus radiated. The fistulas led into the submucosa. The mucosa at the entrance of the oesophagus, as well as at the exit of the duodenum, was punctured like a sieve.

The affection was ascribed, after examination at the Berlin Pathological Institute, to a sarcomatous degeneration of the stomach.—*Zeitschrift für Veterinärkunde.*

CLOUDINESS OF THE LENS AND CIRCUMSCRIBED
PUNCTIFORM CONJUNCTIVITIS CAUSED THROUGH
AN INJURY.

BY STAFF VETERINARY-SURGEON KRAEMER.

AT the beginning of May, 1912, an officer's horse, which the owner had had in his stable for several years, was sold to an infantry officer. The horse was examined by me at the time and both eyes passed as all right.

Nine days afterwards the buyer sent word that the horse was suffering from periodic ophthalmia, on which account he placed it at my disposal. Thereupon the horse was immediately fetched back and once more examined, when the following condition was noted.

On the conjunctiva there were two punctiform greyish white irregular-shaped spots, the surface of the cornea was quite smooth. The iris and lens showed no pathological changes; further, there was no sensitiveness to light and the two eyes did not differ from each other in size.

With the ophthalmoscope streaky and punctiform opacities running in opposite directions could be seen in the rather fluid contents of the lens; these were rolled up like sediment at every movement of the eye. Sight tests appeared to show both eyes to be normal. Since every internal inflammation of the eye is now classed as moonblindness, there was no contesting the matter from a forensic point of view. It was remarkable, however, that on examining the horse at the time of sale and also the year previously, nothing wrong had been noticed with the eyes. The horse had been sent here by road and thence to an outlying garrison, and a few days later had been transported to the training ground, and as the result of a blow in the eye these changes had developed. The presence of an abrasion three fingers breadth behind the affected eye, which was not there previously, pointed to this. Since in men a blow in the eye produces such cloudiness of the lens, which is brought about by small hæmorrhages and can arise in a few days, so in this case such a cause must be accepted, and that this was so was confirmed by the fact that the spots on the conjunctiva and the cloudiness of the lens both completely disappeared in ten days without any treatment.—*Zeitschrift für Veterinärkunde.*

ON THE EFFECT OF CARBON DISULPHIDE ON
GASTRUS LARVÆ INVASION.

BY STAFF VETERINARY-SURGEON DUILL.

IN the spring of this year two five-year-old horses were brought to me which frequently passed gastrus larvæ in the dung. Gadfly larvæ occur actually only in grazing animals. They take the parasite up from the eggs deposited on the hair of the animal by the gadfly. The eggs, by licking of the coat, are transferred to the mouth and thence to the stomach. With the armed anterior end the maggot bores into the pyloric portion of the mucous membrane and remains there for about nine months, until its complete development. It was assumed that the two horses had taken up the larvæ in the summer of the preceding year and that the mature examples passed out with the excrement in the spring. On account of the quick following each other of larvæ a considerable invasion was feared. Practice teaches that gastrus larvæ are usually non-injurious parasites, and in spite of the frequency of their occurrence in the stomach of horses they only exceptionally cause illness. By great aggregation they may, however, give rise to digestive disturbances, emaciation, and colic, and if only few in number they may lead to abscesses in the stomach walls, perforation of the stomach and fatal peritonitis and by boring into the arterial blood-vessels cause hæmorrhage in the host. Also wandering of the larvæ occurs; they may cause symptoms of disease in the nasal passages, brain, bladder, and other places.

Arising from the foregoing I resolved to remove the larvæ with carbon disulphide. Each horse at night received an aloes ball after it had been dieted for a day, and in the course of the next day four balls of carbon disulphide in 10 grm. (about 3iiss) doses made up in a gelatine capsule. The effect of carbon disulphide is rather alarming to those who see it for the first time. Directly after administration of the first dose severe colic occurred in both horses. They threw themselves down and rolled unceasingly in the straw for five to ten minutes; then they quietened down, and after a short time gave one the impression of being under a considerable dose of morphia. They paid no heed to commands and had to be shoved over if moved. Several times I noticed that one animal laid down

and appeared as if in deep sleep. After administration of the second dose, the same symptoms occurred. After the third dose the colicky symptoms were plainly weaker, and after the fourth remained almost completely absent. The narcotic symptoms had nearly disappeared two hours after the last dose. It was remarkable that the signs of colic were so violent after the first dose and quite absent after the fourth. I consider that the effect of the first dose was to cause the parasites to bore deeper into the mucous membrane in order to avoid the action of the drug and by so doing they caused the animal more pain. After the third dose only a few maggots clung to the mucosa, and after the fourth none at all. A tolerance of the mucosa to the action of the drug could not be accepted. On the subsequent days whole clumps of the larvæ were ejected. The carbon disulphide produced a good effect and the accompanying startling symptoms were without significance.—*Zeitschrift für Veterinärkunde.*

Canine Clinicals.

INTERESTING PARTURITION CASE.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

THE power of resistance sometimes exhibited by the bitch at the period of parturition was well illustrated in a recent case.

One of the toy variety having congenital stricture was successfully mated after dilatation. At term the owner, having watched her with labour pains for some hours, became alarmed, and brought the dog for inspection, with the request that every endeavour should be made to obtain the puppies without resource to abdominal operation. On examination the whole vagina was found to be constricted, allowing barely the passage of a finger. The uterus was high up in the abdomen and had not "come down" at all. The membranes had ruptured. With some difficulty forceps were introduced and the head of a puppy seized and crushed, and an endeavour made to withdraw it. Some progress was made, and the puppy brought nearer to the vaginal outlet. After a further interval, hoping for some relaxation, and further conversation with the owner, consent was obtained

to perform a pan-hysterectomy. The bitch was chloroformed, and on opening the abdomen the peritoneal cavity was found to contain foetal fluid, and a transverse tear of the floor of the uterus immediately anterior to the os about half an inch long was plainly visible. I presume this had been produced by traction on the foetal head drawing the uterus unduly within the vagina. I do not think forceps would have caused a wound in this situation, nor would the direction of the tear have been transverse. The uterus, with its contents, was removed with ligatures in the usual way, and the abdomen flushed and cleaned with boiled water. The uterine stump was swabbed with tincture of iodine diluted with twenty parts of boiled water, as, although care had been taken in washing the hands and boiling the instruments, and the bitch had been douched with warm water containing perchloride soap, still it is more than probable that after a lapse of twelve to fifteen hours since rupture of the membranes the uterus contents were not free from contamination. The uterus contained one large puppy, and was devoid of any appreciable amount of fluid. Recovery was uneventful. This is, of course, not unusual in a pan-hysterectomy, but I think is somewhat remarkable when complicated by a ruptured uterus with escape of foetal material. Within three weeks the bitch was on the show bench.

PARTIAL PARALYSIS AND DILATATION OF THE RECTUM.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

WITHIN the last twelve months two cases of partial paralysis or dilation of the rectum have been brought to me. In neither was the sphincter muscle affected. Both had a similar history, and were clinically identical.

The dogs made frequent unsuccessful efforts to defæcate and strained persistently, occasionally passing a small motion with evident incomplete satisfaction. On digital examination the anus appeared to be normal. The rectum was dilated, filling the greater part of the pelvis, and firmly packed with semi-solid fæces. When these were removed the rectum contracted, but within a day or two the condition recurred, and the same process had to be repeated. If a purgative producing a marked action was given

then the fæces were voided. Neither case responded to treatment, which consisted of tonics and daily cold-water douches to the rectum. Are such cases common? I have not seen them described.

AN INTERESTING CASE OF CEREBRAL PARALYSIS.

By JAMES CHALMERS, M.R.C.V.S.

Government Veterinary Surgeon, Ermelo, Transvaal.

Date.—February, 1913, at Ermelo.

Subject.—Rough-haired Irish terrier dog.

History.—Was found by owner lying huddled up and apparently unconscious, with blood over the head and running out of nose. The day previous animal was quite bright. This particular dog was rather friendly with me, and was seen the night previous, when he was in good health.

Diagnosis.—Cerebral paralysis.

Prognosis.—Guarded, but, if anything, unfavourable.

Treatment and Remarks.—The dog on examination was found to be unconscious, affected with cranial hæmorrhage, epistaxis, and secondary paralysis.

Pulse weak, hardly perceptible. Temperature 100.6° F. After washing away all blood and carefully searching for cause of paralysis I was able to locate the entrance and exit of a small bullet, probably shot out of a B.S.A. air rifle. The entrance was on the right side of the median line on top and back of head where the occipital and parietal bones meet, and the bullet had apparently glanced through the skull to come out on the left of the median line just in front of the symphysis of the inferior maxillary bones. The right eyeball was distended, due to hæmorrhage, and the humours of the eye were suffused with blood.

I did not attempt to probe wound on account of the structures involved. The wounds (including the eyes) and surrounding areas were dressed during the whole treatment with an antiseptic consisting of 1 gr. chinisol to the ounce water.

Due to the coagulation of blood producing occlusion of the nasal chambers an inhalation was used of equal parts of terebine and tinct. benzoin co. (teaspoonful to the jug of boiling water),

to perform a pan-hysterectomy. The bitch was chloroformed, and on opening the abdomen the peritoneal cavity was found to contain foetal fluid, and a transverse tear of the floor of the uterus immediately anterior to the os about half an inch long was plainly visible. I presume this had been produced by traction on the foetal head drawing the uterus unduly within the vagina. I do not think forceps would have caused a wound in this situation, nor would the direction of the tear have been transverse. The uterus, with its contents, was removed with ligatures in the usual way, and the abdomen flushed and cleaned with boiled water. The uterine stump was swabbed with tincture of iodine diluted with twenty parts of boiled water, as, although care had been taken in washing the hands and boiling the instruments, and the bitch had been douched with warm water containing perchloride soap, still it is more than probable that after a lapse of twelve to fifteen hours since rupture of the membranes the uterus contents were not free from contamination. The uterus contained one large puppy, and was devoid of any appreciable amount of fluid. Recovery was uneventful. This is, of course, not unusual in a pan-hysterectomy, but I think is somewhat remarkable when complicated by a ruptured uterus with escape of foetal material. Within three weeks the bitch was on the show bench.

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Due to the coagulation of blood producing occlusion of the nasal chambers an inhalation was used of equal parts of terebine and tinct. benzoin co. (teaspoonful to the jug of boiling water),

and patient allowed to inhale fumes three times daily for ten minutes.

Internally a pill was first given consisting of hydrarg. subchlor. gr. iii; Podophyllin resin gr. $\frac{1}{2}$; followed every two hours by—

R Pot. brom.	...	...	...	...
Ammon. brom.	...	...	...	...āā gr. x.
Pot. iodi.	...	...	...	... gr. xx.
Liq. strychniæ	...	...	...	... ℥ ii.
Aq. ad.	...	...	...	... ʒ i.

Diet consisted of milk, eggs, Bovril, and arrowroot gruel. After two days the animal began to "show life" by endeavouring to raise its head—very unsteadily.

The treatment was then changed to the following mixture due to the hopeful signs of endeavouring to lap milk:—

R Acid nitro hydrochlor. dil.	...	...	...	... ℥ xlv.
Liq. strychniæ	...	...	...	... ℥ xlv.
Tinct. gent. co.	...	...	...	... ʒ iv.
Syr. aurant.	...	...	...	... ʒ i.
Aq. ad.	...	...	...	... ʒ viii.
ʒ ss ter in die.				

In a few days the animal began to endeavour to move about, and if placed on its legs would try to walk, but the gait was very unsteady and uncertain, there appearing to be no control or co-ordination.

The dog was then put on raw minced meat and fed by hand. About fourteen days from when first seen the patient was taken into the open, and on being called made a gallant attempt to walk, but the peculiarities noticed were that the animal lifted the front paws high off the ground and generally collapsed to the right side.

The treatment was then to give three times daily after food one of Messrs. Burroughs Wellcome and Co.'s Tabloid Bland Pill Compound No. 1, consisting of:—

R Pil. ferrugin (Bland)	...	...	...	gr. x.
P. capsici	...	...	...	gr. $\frac{1}{4}$
Aloini et strychniæ et acidi				
arseinosi	...	...	...	...āā gr. $\frac{1}{3}$ dr.

I cannot speak too highly of this latter pill as a hæmatinic, which I find of great service in anæmia in dogs.

The patient has made an uninterrupted recovery, and although he to-day walks peculiarly by elevating the paws too much, there is only left a small exostosis on the parietal bone to prove where the bullet penetrated.

Miscellaneous.

"SWEET LAVENDER."

A PERFORMANCE of the above drama, by Arthur W. Pinero, was given at the Town Hall, Maidenhead, on May 7 and 8, with a matinée on May 8, in aid of the Victoria Veterinary Benevolent Fund for the assistance of necessitous widows and orphans of members of the Royal College of Veterinary Surgeons.

The *dramatis personæ* were: Mr. Geoffrey Wedderburn (of Wedderburn, Green and Hoskett, Bankers, Barnchester), Lucian Oldershaw; Clement Hale (his adopted son, studying for the Bar), Percy J. Simpson; Dr. Delaney (a fashionable Physician), Sidney F. Isaac; Dick Phenyl (a Barrister), Sydney R. Thompson; Horace Bream (a young American), Scott Hill-Reid; Mr. Maw (a Solicitor), Harry J. Webb; Mr. Bulger (Hairdresser and Wig-maker), Philip D. Thompson; Mrs. Gilfillan (a Widow—Mr. Wedderburn's Sister), Bertha Heybourn; Minnie (her daughter), Winifred M. Hards; Ruth Rolt (Housekeeper and Laundress at 3, Brain Court, Temple), Essie Crowe; and Lavender (her daughter), Beatrice M. Budgen. The play was produced under the direction of Mr. Alfred Starling; Mr. Walter W. Mead acting as stage-manager.

The stewards, &c., were Messrs. J. P. Balson, J. Barley, G. H. A. Currier, S. Dobson, W. E. Henry, R. Hill, G. H. Hunter, E. Neve, H. Neve, T. Pettit, F. Ratty, C. M. Townsend; and programmes were disposed of by Mrs. Diddams, Miss de la Hay, Miss Pettit, Miss Pope, Miss Rance. The orchestra, which was under the direction of Mr. F. Willett, included the Misses Millar Inglis, Lewis, Martin, Daisy Skinner, Mabel Swallow, and Messrs. C. Armitage, W. F. Gibbons, N. Langston, A. Webb.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—May I crave a small space in THE VETERINARY JOURNAL to express my grateful thanks to all those members of the profession who so kindly responded to my appeal on behalf of the Victoria Veterinary Benevolent Fund. I enclose a short balance sheet which shows a profit of £69 14s. 10d., but in order that the Secretary of the Fund shall not be bothered with odd amounts I have sent him a cheque for £70.

May I also thank you, sir, for your kindness in so freely

advertising "Sweet Lavender" without charge.—I am, sir, yours faithfully,

PERCY J. SIMPSON, F.R.C.V.S.

Maidenhead, May 13.

Receipts. By	Donations	...	...	...	...	£24	12	0
	Sale of tickets, "Sweet Lavender"...					74	14	6
	Sale of programmes, chocolates, &c.					10	5	8
						109	12	2
Expenditure	...	...	...	...	...	39	17	4
						Balance, being total profit	£69	14 10

Reviews.

Ophthalmology for Veterinarians. By Walter N. Sharp, M.D., Professor of Ophthalmology in the Indiana Veterinary College. 210 pages, illustrated. Cloth, 8s. 6d. net.

This work is concisely written, well printed, and liberally illustrated, and will enable the reader to classify any affections of the eye he is likely to encounter in veterinary practice. The chapters deal with the anatomy of the eye, the examination, various diseases, injuries, parasites, errors of refraction and therapeutics of eye treatment.

It is questionable whether animals undergo a number of the eye troubles prevalent in human beings. They do not strain the eyes unnaturally to such an extent, nor try to decipher small print in a faulty light, neither do they suffer from some hereditary and acquired diseases affecting mankind which indirectly play havoc with the eyes.

The pages dealing with diseases of the eyelids, conjunctiva, cornea, and injuries of the globe of the eye seem to us to be the most valuable in the volume.

Operation for cataract is seldom performed in animals and then only in the case of the dog, and the intricate surgical procedure involved is really work for a specialist. After-treatment, too, can only be carried out imperfectly.

We should like to have seen the condition known as eczema of the eyelids in the dog fully discussed and reliable treatment suggested. It is a pathological state occurring very frequently in every-day practice which often bothers the veterinarian. It is rather surprising that the uses of hydrogen peroxide in ophthalmic work, and especially in purulent conjunctivitis, appear to have been overlooked.

We think that cold compresses and cold irrigation of the orbital region after prolapse of the eye-ball are very valuable measures. We welcome the book as being very instructive and of much practical value, and it breaks into a literary field that has not yet received the required attention at the hands of veterinarians.

G. M.

The Occurrence and Development of Cervical Ribs in Man and some of the Mammals that have abandoned Quadrupedal Progression. By Walter Stapley, M.D., D.V.Sc., M.R.C.V.S. Proceedings of the Royal Society of Victoria, vol. xxv (new series). Part I.

Cervical ribs are of great interest to the anatomist and the morphologist. In recent years they have become attractive to the surgeon on account of the variation a well-developed cervical rib causes to the course of the subclavian artery. It also produces curious nerve changes in the distal parts of the upper limb.

The surgical aspects of the disturbances caused by a cervical rib are admirably discussed by Keen in a brochure published in the *American Journal of the Medical Sciences*, 1907. Stapley acknowledges his indebtedness to Keen's work, and discusses various opinions concerning the nature of those lateral elements of cervical vertebræ usually termed cervical ribs. The morphological significance of cervical ribs in mammals involves a consideration of the number of cervical vertebræ. Every student of mammalian anatomy learns with surprise the remarkable constancy with which the number remains almost uniformly seven, whether it be the long neck of a giraffe, or the short neck of a seal. The chief variations in the mammalian subkingdom are found among sloths. The two-toed sloth (Unau) possesses only six cervical vertebræ, but the three-toed sloth (Ai) has the exceptional number of nine. These variations are carefully discussed by Stapley, and he offers some instructive criticisms on the mode of enumerating cervical vertebræ deserving the attention of comparative anatomists. His work is also interesting because he endeavours to show that the additional cervical vertebræ of the three-toed sloth are due to atrophy of the first and second ribs; the atrophy he regards as a consequence of the peculiar manner in which this sloth hangs from the branch when browsing.

Stapley is not too familiar with morphology; the principles underlying the development and ossification of the vertebral column he gleans, like Keen, mainly from Bland-Sutton's description in Morris's "Anatomy." Although Stapley cannot make up his mind to regard cervical ribs either as anomalies or as vestiges, he agrees with the best authorities that atavistic parts do not belong to forms palæontologically or systematically far distant, and that the ancestry of such structures lies in forms closely allied. He endeavours to show that cervical ribs develop in the human subject because the lungs have migrated towards, and encroached upon, the neck. His critical analysis of the facts relating to cervical ribs and anomalies in the number of mammalian cervical vertebræ is of great interest, but we fail to find in it a convincing explanation of the fixed type manifested by the skeleton of the mammalian neck.

J. B. S.

Translations.

LAMINITIS AFTER TAKING *CARDAMINE PRATENSIS* (MEADOW BITTER CRESS, LADIES' SMOCK, CUCKOO FLOWER) IN GREEN FOOD.

BY CHIEF VETERINARY SURGEON PFEFFERCORN.

ON July 19 twenty-six remounts were taken ill at Schleinitz with symptoms of laminitis. The fore limbs were stretched apart whilst the hind limbs were advanced under the body. The gait was cramped, the steps short and quick, weight was not borne on the toes, but on the heels. In a few specially severe cases the horses were quite unable to move. Local examination showed increased warmth, great pain on tapping the hoof and on pressure with the pincers. Pulsation of the digital arteries was very strong. General state of health more or less disturbed, whilst in slight cases neither fever nor any great loss of appetite occurred, yet in severe cases there was moderate fever, loss of appetite, and constipation. On account of the number of horses affected suspicion at once pointed to the food. Closer examination showed that cuckoo flower was present in the fodder, and this, as is known, causes the above-mentioned symptoms.

Cardamine pratensis is a cruciferal which is only toxic when in full bloom and fed green; in its dry state in hay no illness has yet been noticed to arise. Through the sweating process, which is accompanied by fermentation from the respective bacteria and kept up by them, water is lost, and in favourable conditions a chemical change takes place which renders the toxic material harmless. It is believed that the nature of the soil on which the plant grows exercises an influence on the formation and amount of the poisonous matter. But not only the soil, but also the manuring and watering, must decide the formation of the toxic material.

The susceptibility for the poison seems to be rather similar in all cases, and is not influenced by breed, age, or sex.

On the method of action in producing illness one is not yet informed. It is most probable that the injurious material is a pure chemical poison.

The plant in question occurs in the fodder grown in newly-cultivated meadows. From the pasture concerned at Schleinitz a cart load of grass in a half dry state, together with vetches, was fed. For four days this was supplied without any subsequent effect on the remounts. It is assumed that the poisonous plant, which in its half dry state was scarcely recognizable in the food, was present, and incorporated in large quantities in the fodder on the day in question.

Treatment was immediate and energetic—bleeding, subcutaneous injections of arecolin, arecolin-eserine, diet, and placing animals in clay—and followed by recovery in all cases.

The course of the malady was varied. In most of the horses the symptoms disappeared from the fourth to the fifth day; in

others it remained a week and longer, even up to two weeks; laboured and sensitive movement and lack of appetite remained.

On the ground of these observations it is recommended only to feed fodder from meadows in which ladies' smock grows in quantity in its dry state, and not to give it green.—*Zeitschrift für Veterinärkunde.*

A GOOD FEEDING FOR MILCH COWS.

By M. J. DUPONT.

For twelve years we have had the supervision of a dairy farm in the suburbs of Paris. The following rations have furnished us with the best results:—

Ration for twenty cows at two meals.

Bran	...	...	...	...	100 kilos.	=	200 lb.
Cut forage (lucerne, sainfoin, clover)	50	„				=	110 „
Rye meal	}	...	...	...	40	„	= 88 „
Maize meal							
Common salt	...	...	...	...	1	„	= 2½ „
Rick food (good meadow hay for preference)	...	...	...	...	100	„	= 220 „

This ration produces a good supply of milk on condition that the rye and maize meal are scalded. To do this *water at the boil* is poured on the meal in the proportion of three parts of boiling water to one part of meal. A bucketful of meal absorbs about three bucketfuls of boiling water.

Two persons make the mixture; one pours in the water and the other mixes the meal so that there are no lumps in it, the whole operation being done rapidly.

The mixture made, it is covered up to retain the heat, and is not used until three or four hours afterwards. The homogeneous paste thus obtained is intimately mixed with the bran, and afterwards the chopped forage is added and incorporated.

To this nutritive and healthy feed a good warm drink made with thirds or barley meal, is added.

Beetroot feeding has never given us good results. The milk produced has been neither good nor abundant when these have been used. Carrots, on the contrary, may be recommended, without, however, giving in too large quantities at any time. Linseed cake gave excellent results when wishing to perfect fattening. Beetroot pulp (residue of sugar refining) and potato residues ought to be excluded from the feeding of the milch cow. The milk produced is mediocre in quality. The butter made from cream provided from cows fed on pulp leaves much to be desired. Its preservation is difficult. Pulp is largely used on farms in the large suburbs of Paris. Added to cut straw it forms the basis of the feed of milch cows in these quarters. The bad hygienic conditions of cow-houses and defective feeding contribute much to the multiplication of cases of tuberculosis which one meets with in Seine-et-Marne and in Seine-et-Oise, particularly in the Vexin.

At present the price of the typical ration which has always given good results is certainly rather high. Rye and maize are at a high figure. For some seven or eight years rye has sold at 11 to 14 francs a hundredweight; to-day it fetches 23 to 24 francs. Maize has increased less in price, but, nevertheless, the advance has been considerable. Rich foods have increased so much in price that town milk producers have been led to find less costly rations. The economy obtained has often been more apparent than real. Certain by-products considered economical have really been little so.

It is regrettable that dairy farmers who produce rich and wholesome milk have no means of selling it at a sufficiently remunerative price. The leaning towards the anonymous milk of large dairy companies hinders the country cowkeeper from competing with firms which are gradually monopolizing the Parisian and suburban supply.

If perfection does not exist with the cowkeeper, it is still less so in the country on farms which supply the collecting dépôts. The noisy outcry concerning pasteurization, of which so much is made—very wrongfully—does not hinder milk produced in the country from frequently being tuberculous, rich in impurities, because the product of tuberculous animals improperly housed in cow-houses that escape all regulations and all inspection. Too often from the point of view of the public milk is good which is well presented. The sale of milk is, above all, a matter of advertisement. Every isolated producer who wishes to adopt a rational feeding for his herd, a hygienic but expensive one, renders himself liable to extinction in the absence of well-organized and subsidized advertisement.

In order to bring about a sale of good milk veritably worthy of the name, a model farm with vast meadows should be established not far from Paris, capable of delivering shortly after milking the milk of recognized healthy cows.—*L'Hygiène de la Viande et du Lait.*

ON THE TREATMENT OF HÆMOPHILIA.

By W. SCHILLING,

of Bayreuth.

In a five-year-old boy who had sustained a slight injury to the gums all the hereinafter named remedies were used to check hæmorrhage. Lack of success followed the use of teaspoonfuls of salt, of calcium chlorate, adrenalin tamponing, pressure means, injection of diphtheria serum and sterile 10 per cent. gelatine, application of penghawar yambi and cauterization. Finally, as an experiment, 200 grm. of blood from a healthy man, after defibrinization and dilution with 750 grm. of physiological salt solution, was intravenously incorporated. Schilling is convinced that by this method alone and the use of Röntgen rays (so that, as in leucæmia, the spleen and the bony tubes can be lit up) was death from hæmorrhage avoided.—*Berliner tierärztl. Woch.*

EXPERIENCES ON THE INFLUENCE OF THE POSITION OF THE BAROMETER IN THE OCCURRENCE OF COLIC.

BY STAFF VETERINARY-SURGEON VOMBERG.

AMONG the causes of colic in horses chills and eating straw furnish the chief statistical material.

Chills may arise from standing for a long time after exercise or after the severe exertions of manœuvres. Very often chills are assumed to be the cause when horses standing near the stable door are attacked with colic, or when there is an air outlet at the foot of the stable wall directly behind the horse.

On the internal physiological reaction between the skin and intestinal nerves such external conditions must influence the intestinal activity to a high degree, whether through changing the quantity or quality of the digestive juices or the intensity of intestinal movements.

The eating of soiled straw litter cannot be accepted as a sole cause of disease, otherwise many more colic cases would arise. Other factors must be concerned in the illness: slight gastric catarrh, dampness of the straw, influences acting on the sympathetic nervous system. Doubtless weather conditions play a part: external temperature, movement of air, position of the barometer, and dampness of the air. A low fall of the barometer is generally accompanied by damp, rainy weather, which frequently has as a result the chilling of horses and colic. According to my last observations on the occurrence of colic the barometer stood at not more than 750 m.m., and chiefly at about 740 m.m. It may be taken for granted that there is a certain connection between cases of colic and barometric readings as Chief Veterinary Scholz indicated in the *Z. für V.* for 1898. Also in the communications of Dr. Behrens in *Monatshefte für praktische Tierheilkunde* the connection between the weather and colic is plainly proved.

The object of my observations was to clear up the question of the influence of the weather and position of the barometer on the occurrence of cases of colic.—*Zeitschrift für Veterinärkunde.*

SARCOPTES SCABIEI IN MEN AND ANIMALS.

By Dr. JOSEF VESELY.

MANY cases of itch in man are characterized by the fact that even by microscopic examination of diseased parts the passages or burrows of the parasites cannot be found. But this does not happen in such cases in which, as well symptomatically as also microscopically, the mites are found on the surface of the skin. According to Saidac, 40 per cent. of all diseases here are due to scab mites. Such diseases are mostly localized on the skin of the head and face, which places are avoided by the true scab mite of man (*Sarcoptes scabiei*, var. *hominis*). In the greater number of these cases it was proved that the disease

was transmitted from affected domesticated animals, chiefly dogs and cats.

Vesely has proved by the microscopic examination of the epidermis of scabby dogs and cats that in many cases the mite seeks out the hair follicle. The parasite penetrates into this along the hair and forms narrow, perpendicular and straight passages, at the lower end of which the parasite, with the head directed downwards, may be found. The walls of this passage are formed partly by the horny epidermis layer and partly by dried exudate; the cavity is filled with the excrement and eggs of the parasite. From the analogy of the mode of life of the parasites in transmission on to the skin of men the author reasons out the prevalent symptom of the transmitted disease. The parasite when penetrating into the hair follicle seeks out those which are most developed, and these are those of the head and face. This explains, according to Vesely, the absence of mite burrows in man and at the same time the special localization. The precedent hitherto in the examination of the epidermis (according to Eichstedt-Hebra) does not exclude this possibility. Further, it is known that such transmitted scab is much easier curable; and this is quite evident, since in the perpendicular and straight passages of the hair follicles the parasite concerned is more accessible to medicaments than in the horizontal and winding passages of the epidermis. At the same time this mode of life of the mite corresponds to the external symptoms of the disease, for it causes an inflammation of the hair follicle and falling out of the hair.—*Oesterreichische Woch. für Tierheilkunde.*

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Oesterreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

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THE
VETERINARY JOURNAL

JULY, 1913.

Editorial.

THE ANIMAL ANÆSTHETICS BILL.

THERE is much more than appears on the surface in the subject of the *compulsory* use by law of certain anæsthetics for certain operations upon animals, and although we as a profession are unanimously in favour of the abolition of pain for animals, we have the practical side to consider, and in this the safety of our patients and our duty to the owner must each play a large part.

That anæsthetics should always be used where possible is universally agreed, but to reason for animals by analogy with man in this respect is not possible without the admission of certain variations, and it is in the selection of the anæsthetic that we as a profession must claim our right.

To be compelled to use chloroform for trephining the frontal sinuses in every case is an absurdity, for in many instances the operation is done painlessly with cocaine without even the restraining influence of a twitch, the animal being in the standing posture.

In the extraction of molar teeth, too, there is pain, but unfortunately there is often danger if a general anæsthetic is used, and in this discretion should be allowed.

These two operations have now been withdrawn from the First Schedule, but "line firing" has been substituted, and here, without some qualification as to the amount to be done, there is liability to danger. Thousands of horses are fired in the standing posture every year, some with cocaine and some without, but in hundreds of instances cocaine is all that is required and the patient will stand perfectly still. Besides which, to cast a lot of old horses (and it is upon old horses that firing is more practised than young ones) will mean a certain proportion of fractured spines, an accident avoidable if the horse is done standing. Cats and other small animals should certainly be included wherever "dog" is mentioned, as thousands of these animals are subjected to operation every year.

The Bill has passed its second reading and the promoters are, we happen to know, very anxious to behave with the greatest fairness to the members of the veterinary profession, but before it actually passes into the final stage there are certain very important points to be reconsidered, and to do this properly a committee of competent veterinary surgeons in actual practice ought to be asked to give their advice and opinion.

It will be too late when it becomes law to find out that it has numerous faults and that its provisions cannot be carried out without serious danger to the animals it is intended to benefit, and the practical side must be taken into consideration as well as the sentimental one.

It is necessary that the Parliamentary Committee of our Council should watch carefully what is being done in this respect.

General Articles.

"ENCEPHALIC EMBOLIC STRONGYLOSIS" OR "ENCRANIAL STRONGYLGENIC EMBOLISM."

Comments on Dr. Burton Rogers's paper in the June "VETERINARY JOURNAL."

BY PROFESSOR JAMES LAW, F.R.C.V.S.

IN his earlier work Dr. Rogers has shown a commendable disposition to investigate and advance veterinary medicine, and, when his judgment approved, to cut loose from earlier authorities, though they might have obtained a wide acceptance by the profession: Coming to us with such recommendation, and with the evidence that he had been a careful observer all through the late cerebrospinal equine epizootic in Kansas, his opinion should be treated with respect, and his facts carefully studied as tending to shed light on the affection.

The word Embolus.—It will be noted that he uses the word *embolus* in a sense different from the long accepted one. With him it is not "a clot or other plug brought by the blood current from another vessel, and now impacted into a smaller one so as to establish a complete obstruction." To him the embolus is still free in the vessel, and apparently need not become impacted in order to establish a right to the name. In these days of misapplication of foreign words to express thoughts distinct from their original meaning, and when there is being established a barbaric jargon, destitute of philological bases, it would seem commendable to avoid such vagaries and as far as possible maintain a purity and intelligibility of speech and expression.

The Hook-worm.—Familiar to Dujardin as the *Dochmius duodenalis*, and to Dubini as *Ankylostomum duodenale*, it was later known as *Uncinaria*, and finally as the *Hook-worm*. It is only an old acquaintance under a modern name.

Discredited Theories.—The writer (Dr. Rogers) has done well to call attention to the history of the Kansas outbreak as discrediting several of the claims set forth as to the causative factor.

(1) *The Microbian Theory.*—(a) In Europe and America alike the disease is habitually confined to a given area, but it differs from an *enzootic* in failing to appear year by year in the same locality even under the same conditions of soil, season, rainfall, &c.

(b) A microbe restricted enzootically, but multiplying in the invaded animal body, would presumably maintain its virulence, and continue to spread as long and as far as the favourable conditions extended. Even in Europe this was not the case with the disease in hand; while in Kansas, if the horses were kept indoors, or if brought from pasture, and if they did not speedily die after they were stabled, they escaped altogether. Its behaviour was like a case of poisoning rather than an infection.

(c) In Kansas the affection attended and followed a wet season, with an extraordinary production of cryptogams (moulds, rusts, mildews, smuts, fungi, bacteria, &c.), but its abrupt onset and equally sudden disappearance did not bespeak a poison of a very lasting kind. It broke out during the hot weather of July, and subsided in the end of September, when the cool Fall weather could hardly yet have set in. Liebenner records its prevalence in Germany in summer and autumn when the higher temperature of the soil conduced to active organic growth, yet Hutyra and Marck quote outbreaks in the coldest season (January and February). Localities that suffered in one year might entirely escape the next, yet the disease might reappear after an interval of a few years, showing the existence of conditions favouring it in that district. In Kansas it showed all the characteristics—in sudden appearance and disappearance, in symptoms, and in subsidence when the food was changed—of the old-time poisoning by cryptogamic growths in wet, spoiled fodder. In New York cerebrospinal meningitis is recorded in horses by Large (1847) and Liautard (1869) in connection with fodder spoiled by cryptogamic growth, sparing those on sound fodder and showing some sporadic cases. In Pennsylvania later, Pearson, McCarthy, and Ravenel similarly traced its source to the cryptogams. In the early 'seventies, in the coal-mining region of Scranton and Wilkesbarre, I met with a most destructive outbreak in the pit mules fed on Canadian hay that had been drenched by heavy rains in transit, and that was surcharged with cryptogams. This was sharply circumscribed among the animals fed on the offensive hay, and was immediately put a stop to by change of fodder.

(d) In Europe the cerebrospinal affection, now known as *Borna's disease*, was traced in horses, asses, mules, cattle, sheep, calves, lambs, and dogs, while the recent Kansas outbreak was strictly confined to the equine race. This race restriction was

not due to the lack of exposure of animals of non-equine races, and suggests a difference in this outbreak from some, at least, of those of the Old World, and even from some recorded American instances in which animals of other races suffered as well. It indicates some variation as regards the essential causative factor, or of some hardly less essential accessory one. This would be quite in keeping with poisoning by cryptogams or saprophytic bacteria, with a different species in successive outbreaks or cases, and would discourage the theory of one specific bacterium as the advocates of the name *Borna's disease* maintain. It would favour, rather, the conclusion of a multiplicity of diseases due to as many different poisons, all of which operate on the nervous system so as to produce a general family resemblance.

(e) The advocates of one definite microbe in all cases of *Borna's disease* have failed to reach a common agreement as to the microbe itself. Siedamgrotzky found in the subarachnoid exudate a monococcus (exceptionally a diplococcus). Johné found a predominating diplococcus (free or endocellular) resembling the *Diplococcus intracellularis* of man. Ostertag found a streptococcus in chains of six to nine. Inoculation gave equivocal results. Provó found that his injections beneath the skin, into the nose, eyes or ear, or alimentary tract, failed, while intravenously it proved pathogenic (with exceptions) in the horse, and constantly pathogenic in goats and sheep. Cattle and swine proved refractory. Others had variable results; some a complex growth, as of *Diplococcus pneumoniae* of Fränkel in company with the Borna diplococcus. How much was due to the latter, how much to complex infection, and how much to traumatic injury, is not always easy to decide. It may be that the different cocci found in the successful inoculations, each for itself, found an inviting way made for its entrance and colonization. It may be, on the other hand, that in the unsuccessful cases the subjects had already passed through a mild, unobserved attack, and had been thereby immunized.

This much may, however, be asserted, that the alleged germ, whatever its specificity under the conditions present, is practically dependent on those conditions, so that when these are changed the disease quickly subsides. It is therefore highly impolitic and unwarranted to class the affection among zymotic diseases or

plagues which spread continuously and remorselessly from every point where the microbe has secured an advantage. Our aim should be rather to eliminate the deadly predisposing conditions, without which the microbe is harmless. This was the substance of my answer to a friend who urged me strongly to visit Kansas and help them to arrest the calamity which was carrying off tens of thousands of horses, and which, they felt assured, would spread indefinitely. The outcome has fully justified my advice. It reminds me of another calamity which threatened the bovine race in Kansas, Illinois, and adjacent States in 1883. That was widely announced to be the *foot-and-mouth disease*. It had been so diagnosed by the State veterinarian, and by a veterinarian sent by the Canadian Government. From descriptions published I was convinced that it was *gangrenous ergotism*, and though then Chairman of the Treasury Cattle Commission, I decided that it would be needless to expend time and money on what could be effectually put a stop to by simple dietary precautions. But Kansas quarantined the affected herds, adjacent States quarantined against Kansas cattle, large commercial losses must necessarily follow, and the Assistant Secretary of the Treasury (Judge French) once more urged me to go as an imperative duty. I found the symptoms as I had expected—gangrene of the entire digit up to the coronet, to the fetlock, and in some cases almost to the hock, with similar gangrenous areas of the tips of the ears and of the tail. Very young calves taking milk only, sheep, swine, and horses living in the same muddy yards and ranging the same pastures were virtually unaffected. Horses only showed small gangrenous spots affecting the lips and buccal mucosa, but there were none of the pathognomonic vesicles on these, nor on any of the smaller ruminants, nor on pigs. The case was clear enough to me; but as the destructive lesions were of a terrible kind, well calculated to create a general panic, and as my diagnosis was contradicted by that of the two official veterinarians of Kansas and Canada respectively, I judged it best to make an experimental demonstration, and inoculated swine, sheep, and sucking calves from the active sores of the mature cattle, and waited two days for the result. That was, of course, negative in every case, so the State veterinarian conceded the justice of my position, the quarantine was raised, and simple dietetic precautions proved an effective prophylactic against new cases. Dr. D. E.

Salmon, Chief of the Bureau of Animal Industry, arrived on the last day of my experiment, and we together visited the herds known to be affected in Illinois, and found matters quite as bad as in Kansas, but here, as no quarantine had been imposed, it was sufficient to give the requisite advice as to diet. The two cases stand together as warnings against hasty and ill-founded diagnoses when large interests are involved.

The Parasitic Theory.—I am fully convinced that Dr. Rogers has been led by his enthusiasm to attach too much importance to the embolisms formed by the *S. armatus* (*Sclerostomum equinum*). These embolisms have been long known and appreciated as occurring in the mediastinal arteries and their branches, in the different arteries adjacent, in the posterior aorta, and even in the vessels of the brain, lungs, &c. We are familiar with the bowel and other fatal affections resulting. We are by no means forgetful of the stunted growth, emaciations, anæmias, rachitic, and other wasting affections of which they have been active promoters, if not the primary causes. But in all such cases of wholesale destruction of valuable studs by these parasites we have no observation nor record of instances in which the brain and spinal symptoms have so predominated as to put all others in the shade, and to cause the disease to be named from this one manifestation. And there appears to be good physiological reason why brain symptoms and lesions should be less constant and less in evidence than those of the abdominal and thoracic regions. The mesenteric vessels are the first to invite invasion by the parasite, and they present by far the most constant lesions. Having reached the abdominal aorta, the blood current favours instead of opposing the progress of the larval worm into other vessels back of the mesenteric vessels. Its progress forward is, however, increasingly opposed by the current growing stronger and stronger as we advance toward the heart. The more direct course, from the left ventricular into the posterior aorta, and the much greater volume of blood flowing into this vessel, tend powerfully to drive the parasites back into the posterior part of the body supplied by its branches, and to furnish a corresponding protection to the head, neck, fore-limbs, and anterior part of the chest supplied by the smaller anterior aorta. The fact that the parasite has been found in the brain or spinal cord or their different arteries does not settle the question. The question is: Is it so constant

in these situations as to account for a sudden and most fatal brain and spinal affection such as has never happened before in the history of its ravages? And if it was so in the Kansas ravaged area, why was it not so in adjacent counties that entirely escaped? Why did the supposed deadly parasitism confine its ravages to the months of August and September, when within the animal body the worm is nearly equally active all the year round? Why did the supposed parasitic embolism subside entirely in horses closely stabled? Why did hard-working horses kept indoors entirely escape? Experience shows that indoor feeding is no protection against the worm which is now under consideration. Too often the ova and embryos wash into wells and water supplies, so that the constantly stabled horse is kept continually in a state of intense parasitism. Yet he rarely suffers from a fatal cerebrospinal affection. Young horses are the most favourite and severely beleaguered victims of the parasite. I have seen large studs literally destroyed by this worm, but I have not seen a general complicating nervous affection. To attribute the Kansas equine mortality to the attacks of this worm without another effective concurrent cause is to oppose the trend of anatomical and physiological facts, the evidence of the most common habitats of the parasite, and the general experience of veterinarians. Not one nor ten cases of verminous embolism of the brain, spine, or membranes, though actually demonstrated by careful dissection, can materially shake this position and render it even probable that the 20,000 or 30,000 deaths of horses in a limited area in Kansas were simply through embolisms of the nervous systems caused by the worms.

Worms as a possible Accessory Cause.—The question is pertinent: Is there no other way in which the parasites may be conceived to contribute to a fatal poisoning? Among the most deadly poisons are proteids from the animal or vegetable kingdom, unchanged by digestion or by passing through the alimentary or other mucosa. These operate mainly by enormously increasing the susceptibility to the same poison introduced after a moderate length of time. G. Wells shows that one millionth part of a gramme of crystallized white of egg sensitizes a guinea-pig, so that a second dose of the same administered after an interval is fatal. The endotoxins of cryptogams and bacteria are proteids, and doubtless many of them when injected, without

passing through an animal membrane and undergoing change, can act in this deadly way. Place beside this the fact that the *Sclerostomum equinum*, like other blood-sucking parasites, leaves a raw surface wherever it has bitten, and we can easily conceive how a horse sensitized by the entrance of the toxic proteid through an early series of bites, and not immunized in the interval, may be fatally poisoned through a new dose of the same poison similarly introduced through a later series of bites. This has not been proved to exist in the Kansas disease; but as we have been dealing with theories, as yet unproved, it seems permissible to introduce another, one with a not unreasonable, scientific basis, and which has not yet been put out of court by the stern logic of facts. It must be conceded that a long experience without such a happening is unfavourable to its acceptance. We would require to assume that a source (probably cryptogamic) of one of the most deadly poisons has not hitherto synchronized with an infestation by this blood-sucking parasite so as to produce a panic among horsemen. And it may well be asked if the proteid poison was only produced in that small area and for that short time, how did surrounding parts escape? Assuredly many other places harbour the parasite in Kansas and elsewhere. Again, how did the poison so quickly lose its toxic power when the disease subsided? It is making a heavy demand upon our faith to ask us to accept a reason for the extreme limitation of such a supposed cause. But the disease itself was confessedly limited as to area, and no good and sufficient explanation has yet been furnished, apart from the presence of cryptogams and bacteria. If this will serve to instigate inquiries that will throw more light on the subject it will not have been suggested in vain. If disproved, it will at least have to a certain extent cleared the field and narrowed down future inquiry to a more promising margin.

Value of Vermicides.—In "Question 32" the question is rather defiantly put if the thousands of doses of vermicides given were not a main factor in reducing the deaths? The objector might well retort: What of the blatant claims of the battalion of secret nostrum vendors who invaded, and still infest, devastated Kansas? No one of these will allow that any case, not already beyond hope, ever died after taking his panacea. Treatment, antidotal, eliminating, antiseptic, and parasiticide, if well directed, is always good, but with an affection so universal and so quickly

fatal therapeutics is seldom to be thought of or hopefully undertaken. Prophylaxis must be the sheet anchor in our trouble. Vermicides may destroy the mature worms in the *primæ viæ*, and lessen the number of *future infection atriæ*, but this cannot at once close the still unhealed bites, nor hinder the instant introduction of a lethal dose if the poison is still introduced in food or water. Much less can the removal of the mature worms make an end of the immature specimens already entrenched in the vessels, and which still wait their opportunity to produce embolic domiciles to the deadly injury of their host. Anthelmintics are not to be ignored nor forgotten; but when the attack is already on they are but a forlorn hope. Their true field of usefulness is before the attack; and still more important is it to eliminate the poison (cryptogamic, vegetable narcotic, &c.), which is presumably the primary cause of the disorder.

JAMES LAW.

A NOTE ON THE EXAMINATION OF STALLIONS FOR GOVERNMENT CERTIFICATES IN NEW SOUTH WALES.

By T. G. PALGRAVE, M.R.C.V.S.

Auckland, N.Z.

Of the need for the examination of stallions there can be no doubt, but it is open to serious question whether the method of examination as carried out in New South Wales will be of any great use in effecting a general improvement in the horses of that State.

The regulations governing the examination only provide for stallion owners *voluntarily* submitting their stallions for examination, and the only penalty for non-possession of the Government certificate is that the animal cannot receive a prize at any show subsidized by the Government. There is nothing whatever to prevent a stallion owner continuing to use as a sire a stallion that has not been submitted for examination, or has been *rejected as unfit* for the Government certificate; and there is no official objection to his travelling such a stallion and taking as many mares as he can get; neither is he debarred from exhibiting such a stallion at any show as long as he does not receive a prize. Any horse owner of experience can imagine for himself the plausible excuses the owner of such a stallion would have ready to account

for the non-possession of a Government certificate for his stallion when he (the owner) is trying to book mares.

Apart from this, any horseman knows that there are plenty of stallion owners who (for a variety of reasons) never exhibit their horses at shows, and consequently the non-possession of a Government certificate is of little or no consequence to them; and though many of these stallions might pass the examination there are undoubtedly plenty which would not.

The stallions which are shown are generally "the pick of the basket"; and it will therefore be seen that the examination in very many cases does not reach the kind of stallion at which it is aimed.

To make examination of all stallions compulsory, and to render impotent those which failed to pass the examination, might be considered a very drastic step; but the same end might be reached by imposing a tax on all uncertificated stallions three years old or over, and the tax might be made heavy enough to tax the majority out of existence as sires.

The hereditary unsoundness for which a stallion is refused the Government certificate are:—

- (1) Roaring.
- (2) Ring-bone.
- (3) Side-bone.
- (4) Bone spavin.
- (5) Bog spavin.
- (6) Curb.
- (7) Thorough-pin and bursal enlargements.
- (8) Chorea.
- (9) Osteoporosis.

Whether bog spavin or thorough-pin and bursal enlargements (except in so far that the two first are often found in conjunction with badly formed hocks) are sufficiently serious to warrant the rejection of a stallion suitable otherwise as a sire, is a matter of opinion. Why cataract, navicular disease, and bad feet have not been included in the schedule it is hard to understand. Many authorities consider that the predisposition to cataract and navicular disease can be inherited, and bad feet will render any horse comparatively useless.

The regulations provide for the rejection of any stallion not up to standard as regards type and conformation, but they do not

make any mention as to what standard is required, and thereby give scope for much argument and difference of opinion. If by "type" it is meant that the stallion submitted must be true to type of his breed, all cross-breds or grades would be debarred from receiving certificates; if the stallion is not expected to be true to type, in what particulars and to what extent may he differ from it? "Standard" can only mean a fixed standard accepted by the majority of horse-breeders as a correct one, but there is none such laid down in the regulations, nor is any standard that may be in use elsewhere specified. Had the regulations provided that any stallion, though sound, might be refused a certificate if he were, for certain clearly defined reasons, considered unsuitable as a sire, the matter would have been greatly simplified.

It would also be to advantage if the breeding of a stallion were taken into account when a Government certificate is granted. As matters stand, a draught stallion (for example) receives a Government certificate, and that certificate is the same no matter whether the stallion receiving it is a pure-bred Clydesdale, Shire, Suffolk Punch, or Percheron, or whether he is a cross-bred or grade.

The certificates issued in some parts of the United States of America appear to me to be managed on better lines, as they state "pure-bred stallion," "cross-bred stallion," "grade stallion."

POINTS IN THE ANATOMY OF THE FORE LIMB OF THE LLAMA AS COMPARED WITH CAPRA AND EQUUS.

By J. SHARE-JONES, M.Sc., F.R.C.V.S.

University of Liverpool, School of Zoology.

Any information concerning this species cannot fail to prove of interest to the comparative anatomist. A beast of burden used extensively as a "pack" animal in the wild and mountainous districts of South America, where the other more common domesticated animals would be of little if any use, a knowledge of its structure will doubtless be of some value to the veterinary surgeon.

Works on natural history usually include an account of the

distribution and natural habits of the animal. Flower and Lydekker state that "The word llama, sometimes spelt lama, is the name by which the Peruvians designated one of a small group of closely allied animals, which, before the Spanish conquest of America, were the only domesticated hoofed animals of the country, being kept, not only for their value as beasts of burden, but also for their flesh, hides, and wool—in fact, supplying in the domestic economy of the people the place of the horse, the ox, and the sheep of the Old World."*

Referring to the wild animal, Dr. Cunningham says that "It is not easy to describe its general appearance, which combines some of the characters of a camel, a deer, and a goat. The body, deep at the breast, but very small at the loins, is covered with long, soft, very fine hair, which on the upper parts is of a kind of fawn colour, and beneath varies from a pale yellow to the most beautiful snow-white. The head is provided with large ears, in general carried well back, and is covered with short greyish hair, which is the darkest on the forehead. Occasionally the face is nearly black. As a rule it lives in flocks of from half a dozen to several hundreds, but solitary individuals are now and again to be met with. They are very difficult to approach sufficiently near to admit of an easy shot, as they are extremely wary, but on being disturbed canter off at a pace which soon puts a safe distance between them and the sportsman, even though he should be mounted. Despite their timidity, however, they are possessed of great curiosity, and will sometimes advance within a comparatively short distance of an unknown object, at which they will gaze fixedly till they take alarm, when they effect a speedy retreat. Their cry is very peculiar, being something between the belling of a deer and the neigh of a horse. It would be difficult to overestimate their numbers upon the Patagonian plains, for in whatever direction we walked we always came upon numbers of portions of their skeletons and detached bones."

The earliest account of this animal is that by Agustin de Zarate, Treasurer-General of Peru in 1544. Referring to it as a sheep, he states that "In places where there is no snow the natives want water, and to supply this they fill the skins of sheep with water and make other living sheep carry them; for, it must be remarked, these sheep of Peru are large enough to serve as

* Flower and Lydekker: "Mammals Living and Extinct," p. 299.

beasts of burden. They can carry about one hundred pounds or more, and the Spaniards used to ride them, and they would go four or five leagues a day. When they are weary they lie down upon the ground; and as there are no means of making them get up, either by beating or assisting them, the load must of necessity be taken off. When there is a man on one of them, if the beast is tired and urged to go on, he turns his head and discharges his saliva, which has an unpleasant odour, into the rider's face. These animals are of great use and profit to their masters, for their wool is very good and fine, particularly that of the species called Pacas, which have very long fleeces; and the expense of their food is trifling, as a handful of maize suffices them, and they can go four or five days without water. Their flesh is as good as that of the fat sheep of Castile. There are now public shambles for the sale of their flesh in all parts of Peru, which was not the case when the Spaniards came first, for when one Indian killed a sheep his neighbours came and took what they wanted, and then another killed a sheep in his turn."

"The disagreeable habit here noticed of spitting in the face of persons whose presence is obnoxious is common to all the group, as may be daily witnessed in specimens in confinement in the menageries of Europe. One of the principal labours to which the llamas were subjected at the time of the Spanish conquest was that of bringing down ore from the mines in the mountains. Gregory de Bolivar estimated that in his day as many as three hundred thousand were employed in the transport of the produce of the mines of Potosi alone."*

Beddard states that: "A variety of names, Lama, Alpaca, Huanaco, Vicuna, have been applied to these animals; but it appears that the names are in excess of the number of the species. Mr. Thomas, who has lately inquired into the matter, will only allow two, the Huanaco (*Lama huanacos*), of which there are two domestic races, the Llama and the Alpaca, and the Vicuna (*Llama vicugna*). They are both South American in range. . . . The first llama ever seen in Europe was brought in the year 1558 to the town of Middleburg in Holland; it was purchased and presented to the Emperor of Germany. Gesner gives a curious figure of it, representing the animal as a comparatively colossal

* Flower and Lydekker: "Mammals Living and Extinct," p. 303.

beast submitting itself to the guidance of a dwarfish man. The habit of 'spitting' of the lama is well known."*

But so far as the writer has been able to ascertain, after a careful search through the archives of the Library of Natural History in the University of Liverpool and from inquiries made to comparative anatomists, no publication has hitherto been issued concerning the anatomical structure of the animal.

From observations taken on the spot by W. Hope Nelson, Esq., who has an intimate knowledge of the beast and employs a large number on his estates in South America, the writer gathers that the llama is very docile, yet extremely agile, whilst its powers of endurance are extraordinary. From the delicate external appearance presented by the limbs and the nature of the country (without prepared roads) over which the animal is worked, one would naturally expect that sprained flexor tendons, exostoses on the limb bones, &c., which are such troublesome affections in *Equus*, would be frequently encountered. They are, however, practically unknown, a peculiar fact which led the writer to examine the deeper structures of the limb, an examination which brought to light the following points, many of which, it will be observed, have a direct and interesting bearing upon the immunity of the species from such affections as those mentioned above. Throughout a comparison is frequently instituted with *Equus* as the best known domesticated type, and *Capra* a more familiar somewhat closely allied species.

After the removal of the skin from the region of the shoulder it was found that the *scapular fascia* formed a very tough and dense layer, much more dense than in *Equus*, and more even than in *Capra*. In the manner of its arrangement, and the way in which it held the subjacent muscles in position, it resembled that in most other species. Anteriorly, however, it became much more thickened out and spread over the front of the shoulder-joint, binding down firmly the tendon of origin of the biceps muscle and entirely obscuring it from view.

The fascia of the arm was likewise thick, and was continuous inferiorly with that of the forearm. Attached to the summit and back of the olecranon process superiorly this latter formed a powerful binding sheath around the muscles at the back of this

* F. E. Beddard : "Mammalia," p. 286.

region (flexors of metacarpus and digit). It was firmly attached on either side to the lateral edges of the radius, and was so dense that no trace of the lines of division between the superficial portions of these muscles could be made out before the fascia was removed. In most other animals these lines are plainly visible.

At the knee the layer which corresponded with the annular band or ligament had a remarkable arrangement. It consisted of a number of sets of fibres which ran in different directions. They interlaced freely and in such manner that a complete tube was formed around the joint (fig. iv). Owing to the peculiar arrangement of the fibres, this tube, whilst affording a very high degree of protection to the underlying structures of the part, played the rôle of a kind of elastic bandage, and permitted flexion and extension of the joint with unusual freedom.

On the inner aspect of the knee the fibrous carpal arch was peculiar, inasmuch as it was formed by two definite and distinct layers. On making an incision into the superficial layer, it was found to cover the small metacarpal artery with its accompanying vein. An incision into the deeper layer revealed the synovial membrane of the carpal sheath, so that this layer corresponded with the fibrous arch which completes the tube here for the passage of the tendons of the superficial and deep flexor muscles of the digit in *Equus* and other species.

Below the knee it was found that the removal of the skin did not reveal the tendons of these flexors at any part of their course between the knee and fetlock. An incision made in the deep fascia covering the tendon is represented in fig. ii, 13. The cut edge of the fascia has been hooked back to reveal the tendons, and from the figure the thickness of the fascia is apparent.

Upon further dissection the fascia was found to be firmly attached on either side to the metacarpal bone and to pass round the posterior surface of the tendon of the flexor perforatus. It thus completed a long tube for the passage of the tendons of the digital flexors. Inferiorly it blended with the back of the tendon of the superficial flexor, where the latter expanded to form the tubes at the back of the metacarpo-phalangeal joints for the passage of the tendons of the deep flexor. At the front of the joint mentioned it blended with the anterior common ligament.

The flexor tendons were thus encased in a powerful tube

throughout their course down the metacarpal region, and thus not only were the tendons, together with the vessels and nerves which followed their course, adequately protected from external injuries, but the thick fibrous covering would act as a *natural supporting bandage*, which, whilst permitting perfect freedom of action, would give increased strength and power of endurance to the limb.

SUPERFICIAL ANATOMY.

Outer Aspect.—The tubercle of the spine of the scapula could be located before the removal of the scapular fascia, as could also the spine itself, as it extended upwards and downwards from the tubercle. The outer aspect of the humerus was particularly well clothed by muscle. Extending downwards from the external tuberosity at the upper extremity the deltoid ridge could be detected, but it was not so prominent as in *Equus*, neither was the deltoid tubercle, since both ridge and tubercle were concealed by the continuation of the scapular fascia. The latter, after spreading out over the shoulder, obtained a firm attachment to both the tubercle and ridge.

Descending this aspect of the limb we next reach the olecranon process of the ulna (fig. i), which is very prominent and relatively massive.

In the forearm (fig. ii) the outer aspect of the radius is found to be well clothed by muscles, the extensors and flexors of the metacarpus and digits being here grouped around the bone in such manner that only a very small portion of the bone, namely, that between the extensor metacarpi magnus tendon (fig. ii, 6) and that of the extensor of the digits (fig. ii, 14) lies subcutaneously.

The outer aspect of the metacarpal bone is visible almost in its entirety (fig. ii, 16), since the tendon of the lateral extensor of the digit or extensor suffraginis (fig. ii, 3) blends with that of the anterior extensor of the digits (fig. ii, 14) within a very short distance of the carpus.

The layer of dense fascia referred to, and the numerous tendons, completely conceal the first phalanx.

Of the *ligaments*, only the outer division of the great suspensory is visible on this aspect. It appears on the side of the fetlock joint as it passes to join the extensor tendon.

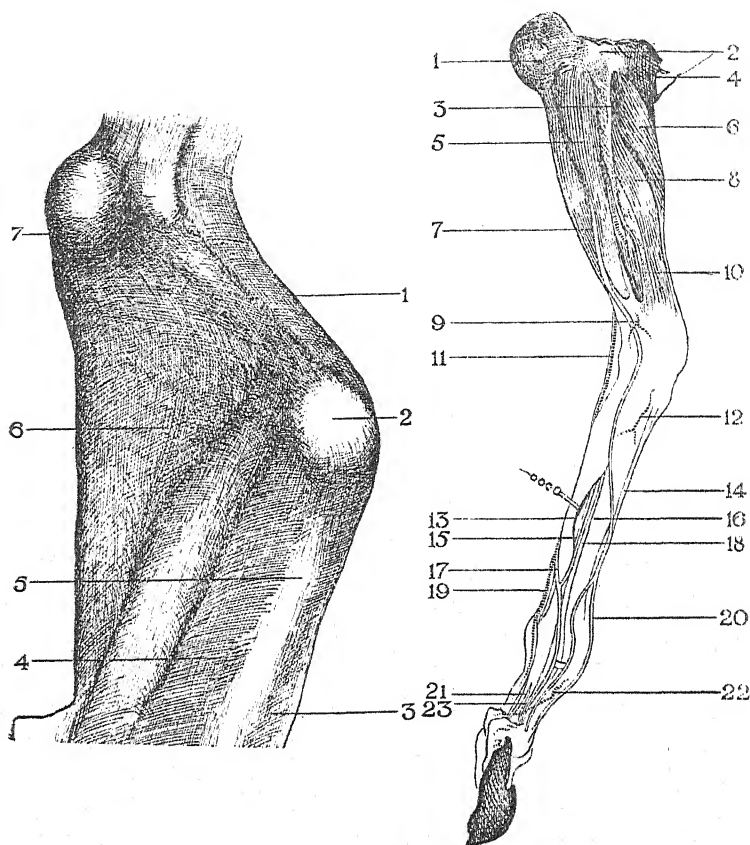


FIG. I.

FIG. II.

OUTER ASPECT OF SHOULDER AND ARM. SCAPULAR FASCIA EXPOSED.

1, Biceps muscle; 2, position of shoulder joint; 3, supraspinatus muscle; 4, infraspinatus muscle; 5, spine of scapula; 6, large head of triceps extensor cubiti; 7, summit of olecranon process of ulna.

RIGHT FORE LIMB. OUTER ASPECT (*continued*).

1, Summit of olecranon process; 2, outer condyle of humerus; 3, lateral extensor; 4, anterior portion of belly of extensor metacarpi magnus; 5, flexor metacarpi externus; 6, posterior portion of belly of extensor metacarpi magnus; 7, superficial division of ulnar nerve; 8, belly of anterior extensor of digits; 9 and 12, superficial arteries referred to in notes; 10, portion of deep flexor of digits; 11, branch of posterior radial artery; 13, dense fibrous layer hooked back to display flexor tendons, &c.; 14, tendon on anterior extensor of digits; 15, tendon of deep flexor of digits; 16, metacarpal bone; 17, branch of communication from internal plantar nerve; 18, external plantar nerve; 19, common digital artery; 20, dorsal nerve from ulnar (digital); 21, tendon of deep flexor of digits; 22, branches of external digital artery (perpendicular artery of pastern); 23, other (external) tendons of deep flexor.

MUSCLES AND TENDONS.

Fig. i represents the muscles on the outer aspect of the region of the shoulder and arm covered by the deep fascia.

Supraspinatus (fig. i).—This is an extremely narrow muscle, narrower than in *Capra*, and much more so than in *Equus*. Its size corresponds to the small infraspinous fossa in the scapula.

Infraspinatus (fig. i).—This muscle, on the other hand, is very large for the size of the animal. In outline it is somewhat triangular, since it broadens out gradually as the vertebral border of the scapula is approached.

The Deltoid (fig. i).—As in most other animals, this muscle possesses a false septum which appears to divide it into two portions. This division is more complete than in *Capra* or *Equus*, and it cuts off a small portion near the inferior extremity of the muscle. This portion conceals about 2 in. of the inferior end of the infraspinatus. Moreover, it has a different insertion from the remainder of the muscle, since it is attached to the ridge just above the tubercle.

Caput Magnum (fig. i, 6).—A relatively smaller portion of this muscle is represented on this aspect. This is due to the greater size of the *caput medium*.

Caput Medium (fig. i).—A very much larger muscle than in *Equus*. It extends upwards beneath the deltoid, and spreads out anteriorly over the lateral surface of the humerus, so that it completely covers the structures in the musculo-spiral groove. Both these heads assist in forming inferiorly the powerful tendon of insertion which is attached to the summit of the olecranon process (fig. i).

Extensor Metacarpi Magnus (fig. ii, 4 and 6).—This muscle is very large, and its muscular portion is somewhat peculiar. It apparently arises in two portions, one of which, the larger, has a broad flat origin from the ridge of bone which constitutes the anterior lip of the musculo-spiral groove. The fibres of this portion have a spiral arrangement. The posterior portion takes origin from the outer condyle (fig. ii, 6) of the humerus in common with the anterior extensor of the digits. The fibres of this portion run obliquely downwards and inwards, and pass beneath those of the anterior division. The two sets of fibres become blended and are succeeded by a common tendon, which

for the size of the animal is very powerful. The tendon passes over the front of the knee and has the usual insertion.

The division of this muscle into two portions is a point of interest. There is no trace of such division in the muscle itself in *Equus*, notwithstanding the fact that it arises from the ridge referred to and the condyle. There is, however, an imperfect division in *Capra*.

The conformation of the muscle differs considerably from that of most other animals, and the arrangement of the fibres is such that in the living animal there is present a depression in the place of the usual well-marked and rounded elevation here found. At first sight this would appear to indicate a relative muscular weakness in this part of the limb. It will be gathered from what has been said above, however, that actually the reverse is the case, and the limb is even stronger so far as the power of extending the carpal joint is concerned.

Extensor Pedis or Anterior Extensor of Digits (fig. ii, 8).—Arises from the outer condyle of the humerus in common with the posterior division of the preceding muscle. The latter overlaps its origin, and the anterior extensor first makes its appearance superficially about 2 in. below the level of the elbow articulation.

Its muscular belly differs in shape from that of most other animals, and is simply a thin strip lying alongside the posterior division of the metacarpal extensor.

Its tendon does not begin until a point about 2 in. above the carpus is reached. It is comparatively thin, and plays over the carpus to the outer side of that of the preceding muscle, passing first over the few fibres which represent the extensor metacarpi obliquus.

Below the carpus it is joined by the tendon of the lateral extensor (extensor suffraginis) and above the metacarpophalangeal joint; the common tendon thus formed splits into two portions, which are inserted into the terminal phalanges of the digits.

It is interesting to note that the division of the tendon of this muscle can be readily observed immediately the tendon appears from beneath the annular band of the knee, so that the lateral extensor is a reinforcement, not of the extensors of both digits, but rather of that of the external digit only.

Lateral Extensor (fig. ii, 3).—This muscle corresponds with

the extensor suffraginis of Equus. In this species it has several interesting features. It arises, as in other animals, from the outer condyle of the humerus, and it has a considerable muscular belly. This is apparent on the surface of the limb throughout its extent after the skin has been removed, appearing between the extensor pedis and the external flexor of the metacarpus.

Midway down the radius it is followed by a powerful tendon, which lies posteriorly on a portion of the deep flexor of the digit.

After passing over the lateral aspect of the carpus beneath the annular ligament the tendon inclines forwards, and at the junction of the upper and middle thirds of the metacarpus it joins the outer portion of the tendon of the anterior extensor of the digits.

The greater bulk and power of the muscle are notable features.

Flexor Metacarpi Externus (fig. ii, 5).—Relatively of large size. A branch of the ulnar nerve (fig. ii, 7) makes its appearance between the tendon of this muscle and that of the flexor metacarpi medius. It calls for no other remark.

Extensor Metacarpi Obliquus.—This muscle calls for special notice on account of its being so poorly developed. Its muscular portion consists of simply a few very delicate fibres. A fibrous band arises from the outer aspect of the inferior third of the radius in front of the tendon of the lateral extensor. It passes beneath the tendon of the anterior extensor of the digits and then obliquely downwards and inwards over the tendon of the extensor metacarpi magnus to its insertion into the metacarpal bone.

This muscle is so extremely rudimentary that it cannot exert any appreciable action on the extension of the knee.

Flexor Perforans or Deep Flexor of the Digits.—A small portion of this muscle is seen on this aspect of the limb between the tendons of the lateral extensor and flexor metacarpi externus (fig. ii, 10). This is most unusual since in most animals the muscular portion is here clothed and entirely concealed by the bellies of the flexors of the metacarpus.

THE ARTERIES.

No vessels are represented in fig. i.

In fig. ii a number of superficial vessels are represented in the region of the knee.

A branch from the posterior radial artery passes outwards beneath the tendon of the flexor metacarpi externus, pierces the fibrous covering of the knee and appears superficially beneath the skin (fig. ii, 9). It splits into two branches which descend one on either side of the branch of the ulnar nerve to be described hereafter (fig. ii, 7).

Fig. ii, 12 represents a vessel which corresponds to the external dorsal interosseous artery. It pierces the fibrous layer from within outwards and splits into two divisions, one of which ascends superficially on the antero-external aspect of the knee. The other division descends and terminates in the skin about 2 in. below the knee on the outer side of the metacarpal region.

Above the fetlock a number of small branches appear from beneath the outer division of the suspensory ligament and are distributed over the lateral aspect of the joint superficially.

Below the metacarpo-phalangeal joint others appear which correspond with those of the perpendicular artery of the pastern.

The above two sets of vessels, together with the vessels of the foot, will be dealt with later.

THE NERVES.

Ulnar.—Passing backwards and outwards from the inner aspect of the olecranon process this nerve runs down the forearm on the deep face of the ulnar portion of the flexor metacarpi medius.

On reaching the inferior third of the forearm it gives off a large branch which passes outwards between the tendon of the flexor metacarpi externus and that of the middle flexor (fig. ii, 7).

This branch passes superficially over the outer aspect of the knee and then runs for a short distance on the surface of the fibrous covering of the tendons of the flexors of the digit. It next runs obliquely downwards and forwards on the surface of the metacarpal bone and inclining towards the front of the limb passes downwards on the surface of the outer portion of the tendon of the anterior extensor of the digits.

Just above the metacarpo-phalangeal joint it divides into two portions and these continue their course downwards and form the dorsal nerves of the digits (fig. ii, 20).

External Plantar (fig. ii, 18).—This is the continuation of the other division of the ulnar. This division passes through the

carpal sheath with the flexor tendons and runs down the metacarpal region on the outer edge of the tendon of the deep flexor of the digits. For the greater part of its course it is thus covered by the fibrous arch which also covers the tendons. Just above the metacarpo-phalangeal joint it appears superficially and is joined by a branch of communication from the internal plantar nerve (fig. ii, 17).

It runs superficially over the outer aspect of the metacarpo-phalangeal joint and is continued as the external collateral nerve of the outer digit.

This latter nerve divides at the fetlock into two portions, the larger of which follows the course taken by the artery which is distributed to this surface of the digit. The smaller, which might be said to correspond to the middle digital nerve in *Equus*, passes forwards and is distributed on the antero-external aspect of the terminal portion of the digit.

(*To be continued.*)

Clinical Articles.

CONGENITAL DEFECT OF THE INTESTINES IN A FOAL.

By J. F. CRAIG, M.A., M.R.C.V.S.

Professor in the Royal Veterinary College of Ireland, Dublin.

CONGENITAL imperfections of the alimentary canal are not uncommonly noted in the domestic animals. The chief malformation observed in the intestines is imperforate anus. In the following case the anus was quite normal in formation and the want of continuity occurred at the point at which the large colon joined the small colon. This abnormality was only recognized at a *post-mortem* examination and was unexpected, the condition being apparently quite unique. The subject was a thoroughbred filly foal, born on May 5 last. The foal was normal in appearance. On the second day it was observed to be constipated and no meconium was passed. Laxatives and enemata were given to it without result. It became very dull and weak and was inclined to turn in circles. Towards the end

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By J. F. CRAIG, M.A., M.R.C.V.S.

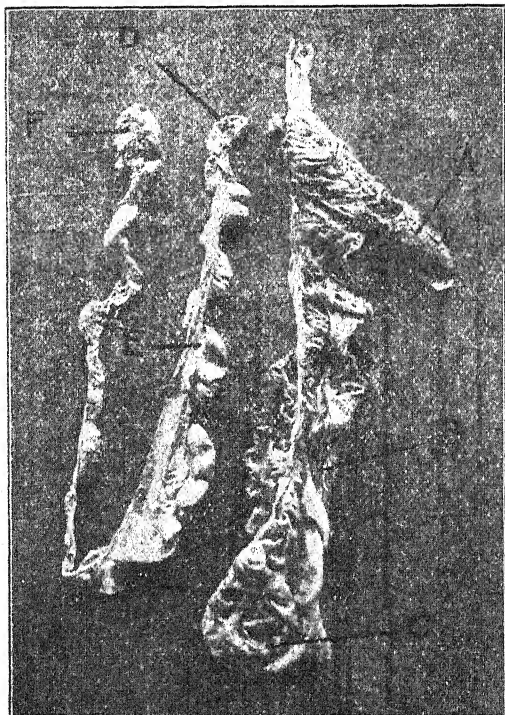
Professor in the Royal Veterinary College of Ireland, Dublin.

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it vomited some of the drench given to it. It died on the third day.

The foal was sent to the College for *post-mortem* examination. This was made about twenty-four hours after death.

The mucous membranes were slightly yellow, the abdomen not markedly tympanitic. On opening the abdomen slight blood extravasations were noticed under the peritoneum at the



A, Cæcum ; B, Large colon ; C, Blind posterior end of large colon ; D, Blind anterior extremity of small colon ; E, Rectum ; F, Anus.

umbilicus over the umbilical vessels, a normal condition. There was a small quantity of blood-stained fluid in the peritoneum. The small intestines were distended with gas, the vessels over them slightly congested. The large colon was represented by a single column of bowel arranged in the normal position, bent on itself behind the xiphoid cartilage of the sternum. The blind extremity was directed backwards towards the pelvis. This piece of bowel corresponded with the first and second portions of

the double colon. The third and fourth portions were absent. The bowel was 2 ft. long, puckered and provided with four longitudinal bands near the cæcum, two of which gradually disappeared. The only opening in connection with it communicated with the cæcum. The blind extremity corresponded with the pelvic flexure of the normal large colon. With the cæcum it was occupied by meconium, which amounted to 3 lb. by weight. The small colon was 3 ft. long, attached by the small mesentery, as in the normal animal, but it ended in front in a rounded blind extremity at the roof of the abdomen on the left side behind the point at which the duodenum is continuous with the remainder of the small intestines. There was no continuity, either apparent or real, between the small and large colon. The small colon was continuous behind with the rectum, which was normal and about 6 in. long. The stomach was filled with a dirty coloured fluid, mixed with globules of oil and pieces of vegetable fibre, but no milk. The lungs along their lower borders were solid.

The accompanying photograph, which was kindly taken by Mr. Geo. Haines, Registrar, R.C.V.I., shows on the right side the cæcum and the abnormal colon, and on the left side the rectum and small colon with its blind extremity.

GASTRIC TYMPANY IN THE HORSE.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

RECENT advertisements of probangs for the horse came to my mind early this month, when urgently called to a horse, which was rightly described by the owner as, "looking as if he have burst." On the previous night, the animal, a cob gelding, had got to the corn-bin and had eaten a considerable quantity of oats. On the following morning he was watered. Within a short time there was a good deal of discomfort. Two colic drinks were given without effect. Mustard had been rubbed on the belly, and the usual colic formula gone through. When I saw him, about eighteen hours after the disastrous meal, he showed every appearance of a horse that had just ruptured, or was about to rupture, the stomach. Cold sweats, an abdominal expression, and frequent, but unsuccessful attempts at vomiting.

The abdomen was enormously distended with gas. Luckily I had with me a horse catheter, and determined to see if this would give mechanical relief. Withdrawing the stilette, I passed the tube up the nostril through the œsophagus, and, as the animal was comparatively small, it reached the stomach. The result was magical. Spray was shot from the mouth of the catheter for at least a yard, and the gas escaped with a hissing noise for many moments. The horse instantly became relieved and his girth much reduced. As a preventive of further fermentation I poured down the catheter about 1 oz. of oil of turpentine mixed with 3 oz. of linseed oil. No further treatment was required, and I went home feeling that I had been of some use.

ON THE PREVALENCE OF BOVINE SARCOPTIC MANGE.

By HENRY TAYLOR, F.R.C.V.S.

Hayward's Heath.

IN THE VETERINARY JOURNAL for June, 1913, occurs an article on the above by Mr. A. W. Noel Pillers, in which he remarks that the text-books dealing with parasites seem to all comment on its rarity.

It may therefore be opportune at this juncture to add to the list of references as given at the end of the article by Mr. Pillers, three others of which I am cognizant. Possibly there are others.

As far as I am aware the first person in this country to report the occurrence of sarcoptic mange of the ox was W. R. Davis. He met with the disease at a dairy farm near Edinburgh, and published an account of it in THE VETERINARY JOURNAL for February, 1896. Some doubts were expressed at the time as to the correct classification of the parasite, but it was referred to a Continental authority, who confirmed the opinion about it being a sarcopt.

Next comes a record by Thackeray in the *Journal of Comparative Pathology* for 1899 or 1900. He met with an outbreak in England, but from the wording of the article he was evidently unaware of the previous notice by Davis.

Lastly, I reported having met with some cases in Edinburgh, in THE VETERINARY JOURNAL for March, 1902. Since then I have

once more come across the disease. This occurred in two cows brought from a distance into the market here, and to the best of my knowledge a note was inserted in the *Veterinary Record* some six years ago.

Altogether it seems as though this kind of mange is not so rare as the text-books would have us believe. Perhaps now we may hope to have its rarity qualified.

TWO AVIAN CASES.

By G. MAYALL, M.R.C.V.S.

Bolton.

I.—DILATATION AND PARALYSIS OF THE CROP (CROP BOUND).

A WHITE Leghorn hen, brought to me on June 7, had a large swelling at the crop. This was hard, painless, and dilating the crop to its full extent. The bird sat in a dejected and listless attitude, appetite was absent. The crop (previously freed from feathers at the site of the incision) was incised, and its contents, about the size of a cricket ball, consisting of hard wheat grains, and impacted fibrous grass were removed. The edges of the wound in the crop and skin were washed with dilute chinosol and all blood swabbed away.

The walls of the crop were sutured with interrupted sutures of sterilized silk, and the skin with an uninterrupted suture of the same material. Brown bread crumbled up fine and milk were given the first day or two, afterwards plenty of water, and the bird kept on soft food for several days. Recovery was uninterrupted.

II.—DISLOCATION OF THE PHALANXES IN THE FOWL.

A Buff Orpington, brought to me on April 4, had a complete dislocation of the first and second phalanx of the third digit. I shaped a piece of gutta percha (previously soaked in hot water), to the joint and when dry and having reduced the luxation, bandaged the digit firmly with a thin plastic bandage (Willows and Co.). It remained in position for about a month and the joint regained its normal appearance and state. The movements of the fowl during the time were limited by keeping it up in a fowl house with a dry and lightly littered floor.

INJURY TO THE MOUTH IN THE HORSE THROUGH
WHITEWASH.

BY G. MAYALL, M.R.C.V.S.

Bolton.

A LORRYMAN put a bucketful of whitewash on the back of his lorry to convey to a place two miles away. A horse fastened to the back of the wagon licked up the whitewash which was upset from the bucket by the movements of the lorry.

On examination of the animal, the tongue, frænum lingue and the lips were excoriated, saliva was dribbling from the mouth, and the whole buccal cavity was too sore for the horse to take any food. An electuary of powdered liquorice root, glycerine of belladonna, and boracic acid was prescribed and milk given to drink. Next day the horse was better but vigorously resented any examination of the mouth. On the third day he ate some sloppy food and drank cold water. After the sixth day he had apparently completely recovered. Lime as whitewash is not at all an uncommon producer of mishaps, but I find little in the literature of toxicology and therapeutics regarding accidents from it. Cats and dogs have come under my notice that have been more or less seriously injured by it, and I recorded a case or two of this description in the VETERINARY JOURNAL for 1911, p. 421.

CHRONIC NEPHRITIS IN A HORSE.

BY DR. LORSCHIED.

Clinique of the Veterinary College, Hanover.

CHRONIC nephritis belongs to the not very frequent ailments of horses; its diagnosis is not quite easy, since the clinical methods of examination in veterinary medicine have not yet reached the same point of perfection as in human medicine. The ensuing case is therefore specially noteworthy, since the horse concerned remained a long time in the clinique. Repeated examinations could be undertaken, and finally diagnosis was confirmed by *post-mortem* on the horse in the Pathological Institute of the College.

The horse was left with the history that for a long time it had eaten badly. By questioning, it was ascertained that frequently it only drank half a bucketful of water, and at other times two to three bucketfuls; also the secretion of urine varied in

amount. The animal was a light brown gelding, 7 to 8 years old. The owner stated that the horse came from England, and was used as a racehorse.

The horse had a weak, dull expression, and was in bad condition. The coat was lustreless and staring. The conjunctival mucosa was red and moist. There were cedematous swellings under the chest, on the sheath and extremities. The pulse was 36 to the minute, very strong, uniform, and regular. The heart sounds were remarkably loud. The heart beat thumping and visible externally at the chest-wall. The heart sounds were clear; the field of percussion extended. Nothing abnormal was noticed with the breathing. Food was taken badly, and the horse drank about half a bucketful of water daily.

Examination of urine showed that it was at times coloured yellow, at other times yellowish red. The specific weight varied between 1,035 and 1,045. The reaction was frequently acid. The consistence was muco-thready. The urine was clear. The albuminous contents varied during the time of observation between 0.04 to 0.1 per cent. In microscopic preparations numerous kidney epithelial cells and also granulated cylinders, as well as a few epithelial cylinders, could be demonstrated. About 1 to 1.5 litres per day of urine was evacuated. The horse showed no pain on urinating, but on rectal examination pressure over the left kidney caused it to groan. The surface of this kidney was smooth. With the object of testing kidney function dyes (indigo, carmine, and methylene blue) were subcutaneously injected, in order to note the activity of the kidneys by their passage out in the urine. The colouring stuff was excreted in quite small amounts, and at first excreted much slower than in the case of normal kidneys. After the injection of phloridzin no grape sugar was noticed in the urine, which is always the case in healthy horses.

Diagnosis.—Hypertrophied heart, chronic nephritis.

Since hypertrophy of the heart in nephritis generally arises after six to eight weeks (Strümpel, "Text-book of Special Pathology and Therapy"), so the chronicity and previous history was confirmed.

In the subsequent fourteen days the horse showed the previously described symptoms. The treatment consisted in doses of tannoform and grape leaves. As heart remedies caffeine and

digitalis were given. Dieting was also observed. No improvement could be effected in the condition of the horse; it became weaker and more listless. Gradually signs of uræmia developed after fourteen days' residence in the clinique. The horse showed great somnolence and stupor, and now and then attacks of giddiness. The breathing was laboured. The appetite quite disappeared, diarrhœa set in, and the dung was tinged with blood and bad smelling.

After five days of these symptoms the horse died.

The autopsy revealed pronounced hypertrophy of the left ventricle, chronic parenchymatous nephritis, and severe inflammation of the mucosa of the colon.

The inflamed mucosa was probably due to the products of decomposition of the urine being eliminated through the intestinal mucous membrane, and causing inflammation. (Hutyra and Marek, vol. i, p. 983, English Trans.).—*Deutsche tierarz. Woch.*

Canine and Feline Clinicals.

A SOMEWHAT UNCOMMON CASE IN A BITCH NECESSITATING THE OPERATION OVARECTOMY.

By J. PEDDIE, F.R.C.V.S.

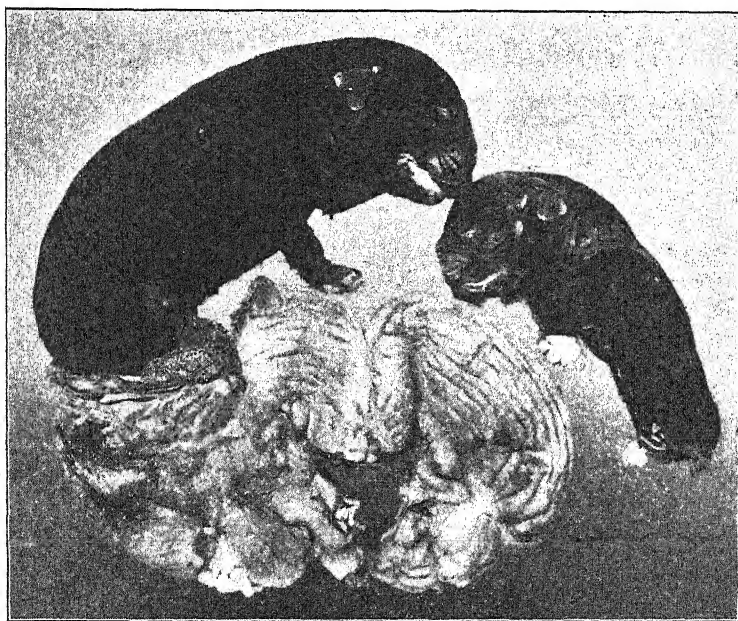
Dundee.

THE following case occurred in my practice two years ago. On Tuesday, May 30, 1911, I was requested to see a bull bitch which was not making progress with whelping. The history of the case is as follows: The owner of the bitch, when she noticed the animal in heat, sent her to the gamekeeper in charge of her brother's kennels in order that she might be properly cared for. Unfortunately, a large retriever dog managed to jump the barrier protecting the bitch, and lined her before being discovered. The bitch began whelping on the Sunday morning previous to my visit and continued during the following day, five pups being taken away by the gamekeeper, also part of another pup, which he informed me seemed to be a very large one.

On palpating the abdomen I could detect one large pup in a horn of the uterus, but could feel nothing on examination *per vaginam*. The bitch, as might be expected, was by this time weak and considerably exhausted.

After thinking over the case thoroughly, I came to the conclusion that the only chance of saving the life of the bitch was to have an operation carried out without delay. To this my client readily consented, as the animal was a very special favourite. I administered a dose of brandy, washed up the whole of the abdomen and perineum carefully with ether soap, and dried with cotton-wool, retaining a covering of this in position with bandages, and had the bitch brought to my hospital for treatment.

As the kennels where the bitch was examined were situated

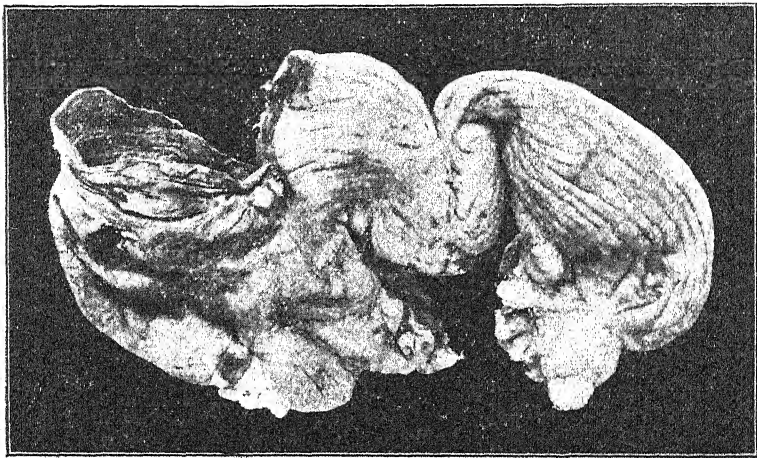


Photograph showing the Rupture and the two Fœtuses.

sixteen miles away, it was four hours later before the operation about to be described was carried out. The bitch was placed on the operating table in the dorsal position, the cotton-wool covering the abdomen removed, and the skin freely swabbed with iodine solution. After anæsthesia had been induced, a free incision was made through the abdominal walls and peritoneum in order to fully expose the uterus.

The accompanying photograph shows very beautifully the appearances presented, which were of quite an unusual and

interesting character. The walls of the uterus were very thin, especially the right horn, which was ruptured in two places; from the largest of these one half of the complete puppy was protruding into the abdominal cavity. The puppy, a portion of which had been removed by the gamekeeper, had come as a breech presentation, and after the hinder parts had been torn away it had evidently receded, and was found in the same horn of the uterus immediately posterior to the rupture. The pups were of great size; I regret I did not have them weighed. It was at this stage clearly evident that an ovaro-hysterectomy had to be carried out. Sterile swabs were placed round the uterus to prevent further infection of the peritoneum, and the pups were removed. Catgut ligatures were then tied above the ovaries, and they were excised with their uterine attachment intact. A



Photograph showing the size of the Rupture in the Uterus.

silk ligature double was passed through the fundus of the uterus and each half ligatured, the peritoneal covering being then drawn over the stump with catgut sutures after it had been previously lightly touched with lysol. The peritoneum was sutured with interrupted sutures of catgut, then the muscular walls, and finally the skin with silkworm gut sutures. Unfortunately, I had no sterile drainage tubes at hand, and had to substitute (by fixing in position between two sutures) a folded piece of silkworm gut. Sterile swabs were then placed over the wound, covered by a

layer of double cyanide gauze and absorbent wool, the whole kept in position by a properly adjusted abdominal girth.

The narrowed tail-piece is made of just sufficient length to reach backward to the anterior edge of the inferior extremity of the vulva, the attached tapes passing up the perineum by the side of the tail, where they are fixed to the most posterior of the cross tapes on the abdominal portion of the bandage. The double tape in front is passed between the fore-legs to the point of the chest, knotted there, and the ends carried up on either side of the neck, knotted again, and finally passed back to be fixed to the most anterior of the cross tapes. A thick folded piece of cotton-wool is laid along the spine to prevent injury where the tapes cross. By this method it is very easy (in a bitch) to retain abdominal dressings in perfect position. Ten ounces of a warm saline solution with half an ounce of brandy was injected into the rectum, and repeated very early the following morning. As there was no serious rise in temperature the dressings were retained in position until the third day, when they were found to be soaked with discharges. The wound and surrounding skin was cleaned up with warm lysol solution, and two drainage tubes inserted, one of glass, 10 millimetres diameter, and the other rubber. The bitch was given one and a half drachms of nuclein solution three times daily, and kept on liquid nourishing diet—milk, fish, soup, beef-tea, well-boiled tripe minced, &c.

On the ninth day a small hernia of omentum was observed protruding through the glass tube, and two days later it had assumed large proportions. The bitch was rechloroformed, the omentum returned, and the tube taken out, a work of some little difficulty owing to the manner in which the omentum had become fixed through the openings in the tube. The peritoneum was closed and the abdominal wall sutured, the wound being left with the single rubber drainage tube. The dressings were continued daily, the discharge gradually ceasing. The remaining tube was taken out on June 19, and the bitch discharged from hospital on June 28 with the operation wound healed, although still wearing a supporting bandage.

My object in recording this case is twofold. First, to place on record a somewhat unusual and rather interesting uterine lesion associated with pregnancy; and in the second place to illustrate the enormous recuperative power of the peritoneum

when infected, as it must have been in this case, through the uterine rupture, and not to describe an operation the technique of which, I am aware, is well known to veterinary surgeons, especially those engaged in canine work.

I am of opinion that the atrophy of the uterine wall was brought about by pressure consequent upon the enormous development of the mongrel puppies contained in the uterus. For the purpose of securing the accompanying photographs the uterus with pups were suspended in a large glass bath containing a solution of formalin, and photographed with an inverted camera.

LARYNGITIS IN THE DOG.

By G. MAYALL, M.R.C.V.S.

Bolton.

AN Aberdeen terrier "Jock," brought in on April 29, was slaving from the mouth and in a lean condition. There was no cough but the dog had not eaten properly for several weeks and was listless and disconsolate; there was foetid breath.

Being a snappy, vicious animal to deal with, $\frac{1}{2}$ gr. of morphine sulphate was injected hypodermically. Half an hour afterwards the mouth was opened widely by means of tapes in the top and bottom jaws, the tongue was depressed and the probang passed. There was no obstruction in the gullet, but on examining the pharynx a piece of abraded mucous membrane, necrotic in its depths, as large as a two-shilling-piece, could be seen at the back of the last molar tooth of the right side of the lower jaw. The excoriated surface extended on to the pharynx. It was swabbed with 10 per cent. hydrogen peroxide solution, curetted and afterwards dressed with boric acid. This treatment was continued for a few days and subsequently an electuary of powdered liquorice and glycerine was given daily. Under this treatment the dog improved sufficiently to lap a little milk and cold water and eat a few pieces of raw meat. He went home in about a fortnight when apparently recovering, and a solution of acid hydrochlor. dil. was prescribed and taken for him, and instructions as to diet given. He lived for about a month and was then found dead in his abode.

Post-mortem revealed septic infection of the pharynx and larynx gradually healing, septic pneumonia and endocarditis with an *ante-*

mortem clot of blood as large as a filbert nut in the right auricle. The original injury of the throat appeared to be due to a wound of the mucosa by a foreign body followed by septic laryngitis. Evidently some of the septic material passed down the wind-pipe on to the lungs and into the blood-stream. A noticeable feature of the case was that the dog never coughed.

TWO UNIQUE INTESTINAL CASES IN THE DOG.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

ARE there many authentic cases of the perforating duodenum ulcer in the dog? Recently one has occurred in this practice. The dog, a fox terrier, had suffered from persistent diarrhoea for about two months, and had been treated by a layman with varying success. When I first saw him he was fairly lively, but thin, had a fair appetite, and a temperature of $102\frac{1}{2}^{\circ}$, and no regular history of vomiting. Tuberculosis immediately came to my mind. He was tested with tuberculin, but the only result, and I must say it has been the usual one in my experience, was that, following an injection of 1 c.c. of tuberculin, as ordinarily supplied, the temperature fell 2° . The diarrhoea, with faeces consisting frequently of bloody mucus, continued in spite of all treatment. Mr. Cousens, M.R.C.V.S., met me in consultation, and from him I obtained the valuable suggestion that tuberculin of human origin applied to the conjunctiva gave a far more reliable result with canines when injected. This was carried out with negative results. The dog now got rapidly worse, and occasionally vomited. Appetite failed, and emaciation was extreme. The amount of blood passed in the faeces increased, and the owner's consent was obtained to destroy it. The *post-mortem* examination revealed a perforating duodenal ulcer about the size of a green pea. There was remarkable thickening of the wall.

The specimen was unique in my experience, and Mr. F. J. Taylor, M.R.C.V.S., kindly showed it at the Central Veterinary Meeting. I am told that none of the members present could recall an entirely similar case. In further conversation with the owner, Mr. Taylor learnt that discomfort had been a feature about two hours after food.

At the same meeting Mr. Taylor showed a portion of a large intestine from a bloodhound. The hound was brought by the owner with

the complaint that he was losing flesh, and that his breathing became laboured on the slightest exertion. Appetite was capricious, but on the whole good, and there was occasional diarrhoea. The temperature was raised one degree. Examination of the chest with a phonendoscope gave no positive indication of disease, and nothing was revealed by manipulating the abdomen. Certainly there was no indication of pain.

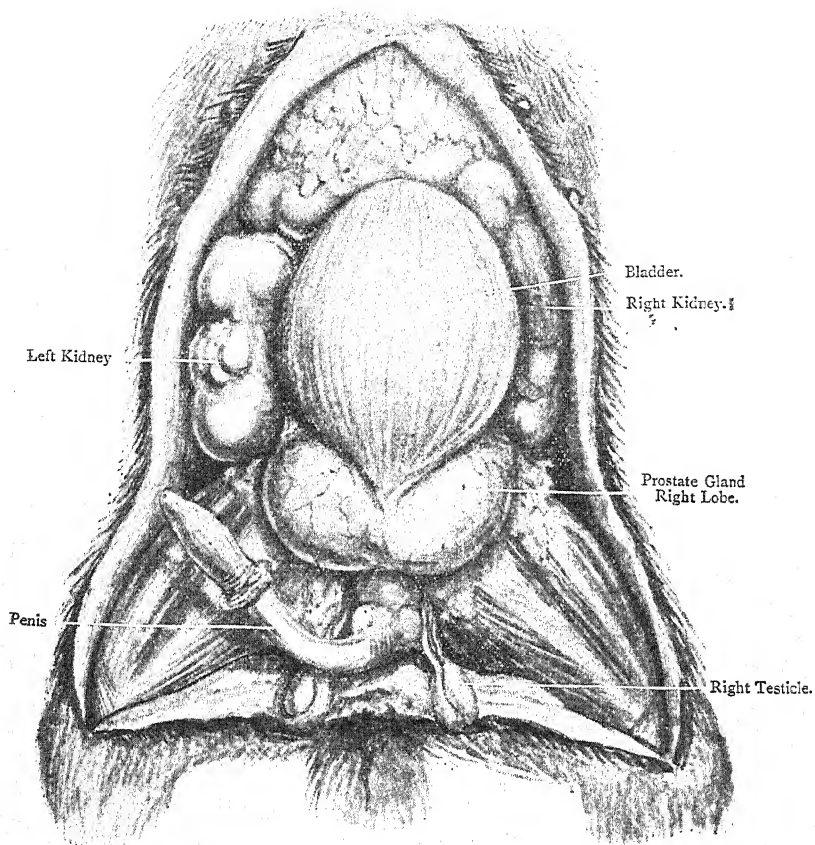
Treatment continued for about six weeks, the patient steadily getting worse, but as is usual in prolonged illness there were intervals of temporary improvement. Towards the end of the illness the hound occasionally vomited immediately after a meal, but in a few hours would usually eat again with relish. He was tested with tuberculin with similar results to the terrier in a fall of temperature. The conjunctival test was negative. He died suddenly after an attack of vomiting. The *post-mortem* examination showed a "dilatation" of the large intestine. On opening this "tumour," an abscess cavity with a capacity of about 5 oz. was revealed. It contained about 1 oz. of thin yellow pus. The normal intestine appeared to be continuous with the wall of the abscess, but I cannot believe that injecta had ever passed through this cavity, but that an abscess had formed between the coats of the intestinal wall and that the division between the lumen of the bowel and abscess cavity had ruptured, shortly prior to death. I am indebted to Mr. Taylor for making a *post-mortem* examination of these cases.

RENAL SARCOMA AND PROSTATITIS (DOG).

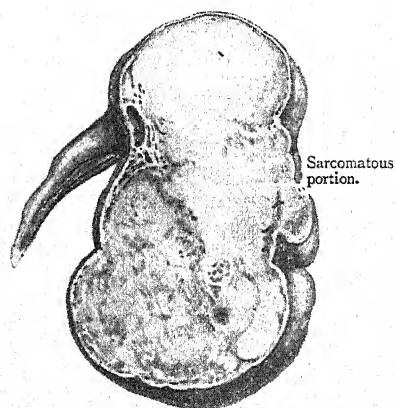
By F. J. TAYLOR, M.R.C.V.S.

London.

Subject.—An aged Aberdeen terrier, very infirm and showing marked inability to use his hind limbs was admitted with a history of frequent micturition, sometimes of a difficult drippy nature, and urine occasionally stained with blood. Constipation, of a most obstinate character, was treated unsuccessfully by the owner; arching of the lumbar region of the spine was noticeable, with evidence of acute pain on pressure. The enlarged prostate could be detected by external flank pressure between the tips of the fingers, and on rectal examination the enlarged and hardened prostate gland could be readily felt close behind and surrounding



Condition found *Post Mortem*.



Section of Left Kidney.

the neck of the bladder, each lobe being almost the size of a bantam's egg.

Treatment.—Warm oily enemata were introduced into rectum every four hours, and catheterization was carried out with difficulty owing to the thickening of the urethra and smallness of the lumen. Iodides were administered without success, and as the owner would not entertain the idea of castration, painless destruction was carried out with morphia and chloroform.

Post-mortem revealed a new growth of glandular tissue surrounded by dense hard muscular tissue, and the left kidney was half sarcomatous, the other half being spurious kidney structure; the right kidney appeared to be hypertrophied but macroscopically normal in structure; the bladder was chronically thickened from cystitis.

INTESTINAL FISTULA IN A CAT.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

I was recently asked to see a male Persian cat with a small swelling in the region of the umbilicus. Whilst examining it, the thin wall ruptured, and about a teaspoonful of yellow pus trickled away. The owner, rather disgusted, suggested that it should come into hospital. On examining the wound more closely, I determined to enlarge the orifice. To my surprise, at the bottom of the cavity appeared a tuft of hair massed together. On seizing this with the forceps a "hairball," about 2 in. long, shaped like a cigar, came from a sinus, which appeared to run through, or between the layers of the abdominal wall. I was afraid to investigate too deeply, though it was evident that there was still *hair* left in the sinus. The portion removed is identical in appearance with a "hairball" frequently found in *post-mortem* examination on Persian cats. The general health of the cat is perfect, but I see no way to account for this "find" beyond the supposition that the mass had ulcerated its way through from the intestine.

The case is three weeks old to-day, and shows no indication of offering a *post-mortem* examination. Is this case unique?

Abstracts and Reports.

SUPERVISION OF MILK SUPPLY.*

By A. M. TROTTER, M.R.C.V.S.

Glasgow.

It is a curious but noteworthy fact that the legislation of this country is so framed that only the milk of those cows affected with such diseases as are scheduled under the Diseases of Animals Act or tuberculosis of the udder can be ordered to be destroyed as unfit for the food of man. This is a grave defect, as the cow is subject to many other diseases which render her milk a dangerous food for human consumption.

The apathy of the authorities in this all important matter is beyond conception. It is our proud boast that in no other country in the world is human life held in such high regard, but a very superficial inquiry will suffice to show that the reverse is the case, as in no other country is the slaughter of the innocents permitted with so much *sang-froid*. It cannot be successfully maintained that the authorities are not aware of the existence of this discreditable condition of affairs, which amounts to a national scandal. Time and again has the imperative necessity of promoting and maintaining a pure milk supply been brought under the notice of the powers that be, but always with the same negative result. Meanwhile the insidious seeds of disease are being spread broadcast over the whole population, causing untold misery and suffering.

A brutal murder is committed in our immediate vicinity and all is excitement. The papers are scanned for the latest information. The perpetrator of the dastardly deed is denounced on every hand; but is the murderer one whit worse than the dispenser of death-dealing microbes in our milk supply? The first is invariably brought to justice, but the second is permitted by law to go scot free and to add insult to injury by charging the full market value for his vile mixture, as if it were a pure, wholesome food. By the law of humanity both ought to be brought to justice, as both are guilty of a crime against mankind. In many instances the cowkeeper is aware that one or other of his cows is diseased, but greed and a callous indifference to the sufferings of his fellows prevents him from destroying the milk drawn from the affected member of his herd.

Diseases other than Tuberculosis.—One of the most common pathological conditions to which cows are subject is inflammation of the udder, technically known as mastitis. The milk drawn from cows thus affected must be regarded as highly dangerous when used for food. The injurious properties of such milk cannot be too strongly emphasized and many instances can be quoted where it has caused illness to the consumer. Professor Holst, of Christiania, observed acute catarrh of the stomach and bowels in four adults and four

* From the Annual Report of the Veterinary Surgeon to the Corporation of the City of Glasgow.

children who resided in three different houses. On inquiry he found that all had partaken of milk some hours previous to the attack. The herd from which the milk had been obtained was examined, when a cow was found suffering from mastitis. The dairyman admitted that the milk from his cow had been mixed with that drawn from the remainder of the herd and sold. The same observer has also placed on record the case of five persons affected with acute catarrh of the stomach and bowels two hours after drinking milk obtained from the one dairy. These illnesses were also traced to a cow with inflammation of the udder; the abnormal secretion of this animal having been added to the yield of the other members of the herd, through the inadvertence of a servant. In Stockholm the members of nine families became ill, exhibiting fever, languor, faintness, nausea, vomiting and diarrhoea. All had obtained their milk supply from the same source. Inquiry at the farm, from which the milk had been obtained elicited that a cow suffered from inflammation of the mammary gland, and that two of the employees in the dairy were incapacitated through a similar complaint to that of the customers. From the milk of the cow and from the faeces of the patients identical organisms were isolated, proving that the illness of the humans originated in the bovine, and was transmitted through the medium of the milk. The danger is all the greater because a chronic form of mastitis may be in existence for some time before the symptoms manifest themselves to such an extent as to direct the attention of the dairyman to it. The organisms causing this type of inflammation are similar to those known to be pathogenic to man.

A frequent source of milk contamination arises from the presence of an abscess located in some part of the udder. These abscesses may discharge externally, and in such cases during milking operations the pus is evacuated and invariably falls into the milk-pail. No doubt this gives "body" to the yield, but its presence, if known, would be as nauseous as it certainly is detrimental to the consumer.

Several decades ago the people of this country were startled by the announcement that scarlet fever was communicable from the cow to man. During an epidemic of scarlet fever it was discovered that the cows of one of the herds supplying the dairy suspected of having spread the infection were affected with an eruptive disease of the teats. The medical inspector who made the assertion believed that this disease of the cow was capable of causing scarlet fever in man, and that veterinary surgeons had failed to recognize the important rôle which it played in the dissemination of this epidemic disease. It was soon demonstrated, however, that a grave error of diagnosis had been committed, because the so-called cow scarlatina was in reality cowpox. Since then, this disease in cows has not received the attention which its importance demands. Everyone knows that a vaccine is prepared from calves artificially inoculated with this disease for the protection of humans against the ravages of smallpox. It is well known, too, that the milkers are frequently infected, but few instances are on record of its transmission through the agency of milk. This is probably due to the

fact that children are rendered immune through vaccination. Stern, however, has published an instance where a large number of children, after they had drunk of the milk of a herd affected with cowpox, suffered from an eruption of the lips which was typical of vaccina.

Within recent years it has been found that the udder of a cow may be the seat of actinomycosis, and it is possible that this disease may be transmitted by milk from cow to man.

Dirt.—The sediment which is occasionally seen at the bottom of a glass of milk after it has been allowed to settle for some time, is a clear indication of a lack of cleanliness either in its production or distribution.

On microscopical examination it is seen to be composed of fragments of vegetable fibres, some of which show evidence of having been partly digested, squamous epithelial cells derived from the skin, hairs, leucocytes, &c., and in some instances blood.

In milk sold in Glasgow, I found in three samples 10·50, 12·26, and 24·77 gr. of dried material per gallon respectively, and the Corporation Chemist some years later found the sediment thrown out by electrically driven separator to average 8·8 gr. of dried material per gallon. Numerous investigations have been undertaken to determine the amount of sediment in milk sold in large towns. In Hamburg it was found to vary from nil to 12·8 gr. of dried material per gallon, the average being 0·9. In Christiania the average per gallon was found to be 0·7 gr.; in Helsingfors, 0·12; in Berlin, 0·7; in Halle, 1·04; in Leipzig, 0·26; and in Munich, 0·6.

Backhaus estimates that 300 lb. of dirt is consumed daily by the inhabitants of Berlin in their milk. It was estimated by the late Mr. Brand, that in 1898, when the population of Glasgow was 724,349, the daily consumption of milk was some 75,000 gallons. Assuming that this estimate is correct, it follows that 104,576 gallons are required per diem to supply the 1,010,000 citizens in Greater Glasgow. If the average filth contamination be taken as 8·8 grains per gallon, then our milk supply each day contains an aggregate of 1,917 oz. of water free dirt.

Undoubtedly the major portion of the dirt in milk is the result of pollution in the byre. The Corporation, in pursuance of their powers under the Dairies, Cowsheds, and Milkshops Order, have issued the following regulation:—

“No purveyor of milk, or person selling milk by retail, shall permit any cow in his possession, or any part thereof, to remain in a filthy condition so as to expose the milk to infection or contamination,” but, unfortunately, its application is confined only to those cows housed in byres located in the city. Every cow kept for the supply of milk for human food ought to be groomed at least once a day. By grooming, dirt, loose epidermis, &c., are removed, and the skin stimulated and toned, and the oily secretion of the numerous sebaceous glands, which serves as a protection against cold and wet, is increased. Its importance is appreciated by a few of our dairy farmers, and is included in the usual daily routine; by others it is either entirely neglected or perfunctorily performed in a spasmodic manner, so that it is not an uncommon sight to see the

poor brutes smeared with their own excrement and all manner of filth. Under these conditions it is not surprising to find our milk supply grossly contaminated with filth. This, however, is but one source of contamination. It is invariably the case that when cows are dirty the byre and the attendants are in the same condition. The majority of the latter have apparently no idea or at least intimate knowledge of personal cleanliness. It will doubtless be urged that the work does not conduce to cleanliness, but such a contention is untenable, because in some cases the farmer has succeeded in obtaining strict attention to this all important matter.

The udder and teats of every cow ought to be thoroughly cleaned before milking operations are commenced. This is not difficult when the cow is groomed daily and a clean bed provided. In all well-conducted dairies clean overalls, and water, soap, and towels are supplied, and the milkers are instructed to wash the udder and teats of any cow which have become soiled, and also to wash their hands before commencing to milk. In the majority of farms, however, no such precautions are taken. The milker, with unwashed face and hands, unkempt hair, and dirty clothing, commences operations by rubbing the udder with the hand so as to dislodge the grosser particles of adhering filth.

Many consider it necessary to keep the hands moist when milking. The necessary degree of moisture is obtained by allowing the milk to flow over the palms of the hands, the surplus being permitted to fall into the pail. The result of this moisture is soon apparent, as it and the continued friction cause the dirt adhering to the teats and hands to soften and drop into the milk. After the milk is drawn from the cow it is invariably passed through a close sieve which retains the greater particles. The portions which remain in the milk become softened, disintegrated, and disseminated.

The milk is, as a rule, consigned to the city in the antiquated wooden butt. The only reason for its survival is that it is almost indestructible. Many arguments, on the contrary, can be put forward for its disuse, but for the present it will suffice to refer to the impossibility of cleaning them, owing to their construction and their porous nature. These butts are closed with cork bungs, and in order to make them fit tightly one or more layers of cloth are interposed. These cloths are used day after day, and owing to their very imperfect purification they soon become dirty in the extreme. As a rule they are easily replaced, as a portion of any discarded cotton article is considered good enough.

The vessels used for the transit of milk from the producer to the distributor are unfastened, and thus ample opportunity is afforded to anyone desirous of tampering with the contents. Instances have been recorded where after the "admiral" had been broached the subtraction has been made good by the addition of dirty water.

The same marked indifference to adopting methods which would minimize the contamination and infection of our milk supply is shown by the majority of the purveyors. The average town dairyman is content to follow blindly the customs of a past generation. The almost universal method of distribution which obtains is proof of this assertion. For instance, the milk sold in shops is invariably

exposed in open vessels, consequently it is liable to be contaminated by the dust of the premises and also from the street. Again, those milk vendors who distribute milk from the cart decant it on the street, where it is exposed to filth and dust. Mention must also be made of the small distributing cans, which are used time and again without any attempt at purification until after the whole delivery has been effected. The dilapidated condition of many of these cans render it impossible to clean them in a thorough manner, and in the crevices a quantity of foul material is not infrequently present.

Inspection of Milch Cows (City).—The cowsheds in the city were visited on 857 occasions, and the milch cows housed therein were examined, with the result that 185 were found affected. These were dealt with as follows :—

51	systemic	...	...	...	...	...	Milk destroyed
2	mastitis, acute	...	...	...	...	...	"
81	,, chronic	...	...	...	...	...	"
51	prominent lymph. glands	...	...	...	...	...	—
<hr/>							
185							

Inspection of Milch Cows (Country).—Farms situated outside the city were visited on 499 occasions, and 14,777 milch cows were examined. 374 were found affected, and dealt with as follows :—

85	systemic	...	...	...	...	...	Milk destroyed
191	mastitis, chronic	...	...	...	...	...	"
98	prominent lymph. glands	...	...	...	...	...	—
<hr/>							
374							

For comparison, I submit the following table to show the work done by this Department during the last four years. It is of interest in showing the striking progressive improvement which has taken place :—

1909			1910			1911			1912		
Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive
Milk from country cows with disease of udder.											
467	24	5.1	506	6	1.18	584	11	1.88	484	0	0
Milk from town cows with disease of udder.											
125	4	3.3	169	8	4.73	151	1	0.66	184	0	0

Fever Hospitals' Milk Supply.—The three farms supplying the fever hospitals with milk were visited on ninety-four occasions. By the terms of contract the farmers undertake "that no milch cow shall be added to, or retained in, the herd if . . . it reacts to the tuberculin test."

The following table shows the number of cows tested with tuberculin, and the number passed or rejected :—

Number tested	Result of test			Rejected
	Negative	Positive	Doubtful	
195	122	68	5	73

In addition to being tested with tuberculin, the cows in these herds are clinically inspected at frequent intervals. On these occasions thirty-eight samples of milk were drawn from cows showing abnormal changes in the udder, and four swabs were taken from cows with a muco-purulent discharge from the lungs. These samples and swabs were submitted to the Bacteriologist, who, after inoculation experiments, reported that they were not infected by tubercle bacilli. The farmers, too, are under contract to immediately notify all cases of illness occurring among their cows, and to isolate all those affected.

VICTORIA VETERINARY BENEVOLENT FUND.

THE annual general meeting of the Victoria Veterinary Benevolent Fund was held at 10, Red Lion Square, London, on Wednesday, June 4, 1913. Present were: W. Freeman Barrett (President), Sir John McFadyean, Messrs. G. Thatcher, N. Almond, G. Banham, F. Gooch, H. MacCormack, J. H. Carter, F. Garnett, A. E. Mettam, F. Hobday, W. Mulvey, F. Bullock, and Wm. Shipley (Secretary).

The minutes of the previous annual general meeting were taken as read.

On the proposition of Mr. MacCormack, seconded by Mr. J. Carter, the annual report was received.

Report and accounts for the nine months ended December 31, 1912, to be submitted to the fifteenth annual meeting of the members to be held at 10, Red Lion Square, London, by permission of the Council of the Royal College of Veterinary Surgeons, on Wednesday, June 4, 1913, immediately after the annual meeting of the Royal College of Veterinary Surgeons, which takes place at 12 o'clock noon.

The Council begs to present its report for the nine months ending December 31, 1912:—

It will be remembered that at the last annual meeting the rules were altered to make the financial year end on December 31 instead of March, so as to coincide with the period for which the subscriptions were payable. The present account, therefore, only includes subscriptions received from new members and arrears, totalling £64 18s. 6d.

The membership of the Society at December 31, 1912, numbered 305, an increase of over 100 for the period.

The relief granted as shown by the following table (not reproduced) amounts to £177 15s. 4d., which is an increase of £24 7s. 4d. over the previous year.

Increased grants have been made in some cases, and there are still many deserving cases which it is impossible to relieve owing to lack of income.

The members are earnestly appealed to to use every means in their power to obtain new subscribers, as it is only by this means that the objects of the Society can be obtained.

A list of the present subscribers is annexed hereto (not reproduced).

VICTORIA VETERINARY BENEVOLENT FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE NINE MONTHS ENDED
DECEMBER 31, 1912.

DR.		CR.
	INCOME.	£ s. d.
To Relief granted ... ..	...	177 15 4
„ London Orphan Asylum grant ... ..	...	2 2 0
„ Printing, postages, advertising, and incidental expenses ... ..	...	25 5 9
		<u>£205 3 1</u>
	EXPENDITURE.	£ s. d.
By Subscriptions ... ..	...	64 18 6
„ Interest and Dividends ... ..	...	67 0 4
„ Income Tax returned... ..	...	3 11 8
„ Excess of Expenditure over Income ... ..	...	69 12 7
		<u>£205 3 1</u>

BALANCE SHEET, DECEMBER 31, 1912.

	£ s. d.	£ s. d.
To Capital account, March 31, 1912	3,384 4 8	
Add—Donations	64 12 6	
Life Member	10 10 0	
		3,459 7 2
„ Income and Expenditure Account, March 31, 1912	103 15 9	
Deduct—Excess of Expenditure to December 31, 1912	69 12 7	
		34 3 2
Four Subscriptions paid in advance... ..		3 12 6
		<u>£3,497 2 10</u>
By Investments at cost:—	£ s. d.	£ s. d.
£3,433 12s. 3d. 2½ per cent. Consolidated stock	2,945 14 7	
£550 3 per cent. Norwich Corporation Redeemable Stock	532 3 6	
		3,477 18 1
„ Cash at Bankers		19 4 9
		<u>£3,497 2 10</u>

We have examined the above accounts with the books and vouchers and certify the same to be correct. We have ascertained that the securities are registered in the names of the Trustees. The Bankers have certified the correctness of the balance on current account.

March 25, 1913.

 JOSEPH WOODGER, } Hon. Auditors.
 ALBERT E. LARK, }

Mr. Freeman Barrett has been re-elected President by the Council.

The following members of the Council retire by rotation: Messrs. W. S. Mulvey, Professor Penberthy, Professor Shave, C. Sheather, Wm. Shipley, P. J. Simpson, and S. H. Slocock; and they have been nominated for re-election. Mr. A. E. West has also been nominated to fill a vacancy.

The Council report the election of Sir Stewart Stockman, Messrs. W. Shipley and F. W. Garnett as Trustees.

The Auditors are Messrs. Joseph Woodger, M.R.C.V.S., and Albert E. Lark, F.C.A., who are recommended for re-election.

The accounts for the nine months ended December 31, 1912, duly audited, are annexed to this report.

The Council desire to point out that it is impossible to give a reasonable statement of accounts as it has only nine months of a financial year to deal with, and the whole of the income was made up from interest and new subscribers, hence the unfortunate deficit of £69. A more explicit statement can be made in future years when the accounts will be made up to December 31, instead of March 31, as previously done.

As was recommended at the last annual general meeting held at Dublin, the following five members, Messrs. J. A. Thompson, O. J. Howard, J. F. Healy, P. D. Reavy, and Professor O'Connor, have been appointed a Committee for Ireland, to consider and recommend to the Council cases of distress. Professor O'Connor has consented to act as local Secretary, and the Council feels it will obtain great help from this Committee in the consideration of cases and in forwarding the work of the Fund in Ireland.

The Council fully recognize that there is a great work to do, and that the members of the profession cannot be aware of the distress that occurs amongst old members, and also amongst the widows and children of veterinary surgeons who have died before they have been able to make proper provision for their dependents. It must be apparent that no grant less than 10s. per week can meet the pressing needs of a widow, even if without little children. It is to be hoped in future no grant should be less than that sum. This would entail at present an expenditure on grants alone of £360 per annum, a sum quite impossible with our present income.

A subscription of 10s. 6d. a year (little enough) entitles to membership.

The Council feel that, if every member of the Fund would endeavour to influence at least one other member of the profession, and point out the good work that is being done, our list should be doubled. *You are therefore requested to post this on to one with an explanatory letter.*

The Secretary will be pleased to give any further information.

By Order of the Council,

W. FREEMAN BARRETT,

President.

After discussion it was adopted on the proposition of Mr. J. H. Carter, seconded by Mr. Banham.

The following members of the Council were re-elected, namely: W. S. Mulvey, Professor Penberthy, Professor Shave, C. Sheather, W. Shipley, P. J. Simpson, and S. H. Slocock, with the addition of Mr. A. E. West, of Gray's Inn Road, London, to fill a vacancy.

The Auditors, Messrs. Woodger and Lark, were re-elected with a hearty vote of thanks for their services, on the proposition of Mr. MacCormack, seconded by Mr. J. H. Carter.

An urgent appeal was made by the President that the members of the profession should give more serious consideration of the claims of the Fund on their charity, in order that the good work which is being done may be more aptly carried out.

The proposition by the Chairman, seconded by Mr. J. H. Carter, of a vote of thanks to the Secretary for the preparation of the report was duly carried.

The Secretary would like to take this opportunity to acknowledge the support which he has received from his friends in the profession, and he only hopes that the slow and steady progress the Fund is making will be continued.

If he were able to indicate to each individual subscriber the pathetic appeals and sympathetic acknowledgments of the little help we are able to give, he feels assured that there is no member of the profession who is able who would refuse to help. He is also anxious to forward to anyone the rules and objects of the Association, and to give any information which may be desired.

WM. SHIPLEY,

Hon. Secretary and Treasurer.

Reviews.

Lehrbuch der Pharmakologie für Tierärzte (Text-book of Pharmacology for Veterinary Surgeons). By Georg Müller, Dr. med. vet. h.c. et phil., Professor of Pharmacology at the Dresden Veterinary College. 2nd edition, 72 illustrations in text, pp. 483. Paper backs, 13 marks; bound, 14'50 marks. Publishers, M. and H. Schafer, Hanover.

This is a very useful book, and among other innovations of an unusual but praiseworthy kind contains the hypodermic doses of various drugs for horses, cattle, sheep, pigs and dogs, as well as plain illustrations of seventy-two drugs and plants used in therapeutics and materia medica. It is quite up to date, and we find included in the text accounts of such medicaments as protargol, argyrol, the suprarenal preparations and their uses, as well as of sera, and bacterial preparations.

The metric system is, of course, used in giving the dosage for

various animals, and in the case of dogs, at any rate, it has its advantages over our system.

The book has been written specially for German and Austrian veterinary surgeons, and the pharmacopœia of both countries has been consulted in its compilation. The pharmacological substances are divided into twenty-one groups, and each group is discussed in a chapter. In order not to make the work cumbersome and to facilitate quick consultation on any subject all literary references are excluded from it. Where the price of a drug is very high attention is called to the fact in the text.

Altogether we think this work is an excellent one, well fulfilling the object for which it was intended, very serviceable as a book of reference, and reflecting great credit on the author and publishers.

G. M.

Studies in the Virus of Hog Cholera. By Walter E. King, F. W. Baeslack, and George L. Hoffmann. Published in Chicago. Name not given.

In examination of the blood of forty hogs (suffering from hog cholera) by the dark field illuminator the authors have constantly found characteristic spirochetes and granules. The spirochetes were discovered with less difficulty in the blood of hogs suffering from the acute than chronic form of the disease. In a little brochure reprinted from the *Journal of Infectious Diseases*, and published in Chicago, the experiments and findings of the research workers are given. They state that "without cultures to inoculate susceptible animals it is, of course, impossible at this time to definitely ascribe to the spirochete under observation any pathogenic properties or ætiological significance. . . . In some particulars the results strongly suggest the relationship of the spirochete (which has been named by the discoverers *Spirochæta suis*) to hog cholera as a causative factor."

Evidently the dark ground illuminator has been of much use to these investigators, and maybe more light is soon to be thrown on the organism responsible for swine fever.

G. M.

Die Bekämpfung der Tuberkulose des Rindes mit besonderer Berücksichtigung der Klinischen et Bakteriologischen Feststellung (The attacking of Tuberculosis in Cattle with special reference to its clinical and bacteriological diagnosis). By Robert von Ostertag, Dr. med. et Dr. med. vet. h.c. Pp. xii + 591, with 88 illustrations. Price, paper, 16 marks; bound, 17 marks 50 pfennigs. Publisher, Richard Schoetz, Wilhelmstrasse 10, Berlin.

At a time when measures against tuberculosis occupy so much prominence in this country, the publication of an exhaustive work on the subject of tuberculosis in cattle from the pen of that great authority Dr. Robert Ostertag is both noteworthy and opportune. Here we appear to be commencing to touch the borderland of

the matter, but in Germany they have travelled a long way. The clinical methods adopted to diagnose open tuberculosis as described in this book are thorough and comprehensive, and include harpooning the udder, collecting mucus from the trachea and bronchi by means of tracheotomy and the taking of swabs through a canula, also obtaining of mucus by means of a throat spoon, and of vaginal secretion by a vaginal spoon. Lung, udder, uterine, and intestinal tuberculosis are thoroughly discussed and dealt with under the heading of "open tuberculosis." The bacteriological diagnosis of this condition and regulations against the disease have chapters to themselves, and the book concludes with a lengthy bibliography of the works consulted. The volume is dedicated to Dr. Bernhard Bang.

No more valuable book on bovine tuberculosis has yet appeared, every phase of the subject is covered, and all technical detail made plain. The question of open tuberculosis and its diagnosis is dealt with by a master hand. The illustrations in the book number 88, and are all interesting and instructive. No veterinary surgeon who can read German should be without the book, and those who cannot should hope for an English translation of it.

G. M.

ROYAL COLLEGE OF VETERINARY SURGEONS.

ELECTION TO COUNCIL.

At the annual meeting of the Royal College of Veterinary Surgeons, held on June 4, the following result of election to Council was announced: Shipley, 887; Mulvey, 847; McKinna, 841; Carter, 840; Price, 795; Slocock, 771; Shave, 766, McCall, 719; Packman, 610; Crowhurst, 555; Gofton, 508. The first nine gentlemen were declared elected. As the result of a ballot, Mr. W. Shipley was elected to fill the vacancy caused by the death of Mr. R. Roberts, and he will accordingly retire in 1914.

ERRATA.

Page 208, line 4 from end, for "*Bacillus bigeminum*" read "*Babesia*."

Page 209, line 24 from end, "a recovery from infection . . . immunity." The last inverted commas are omitted.

Correspondence.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—On looking over a copy of the June issue of THE VETERINARY JOURNAL we observed a reference to one of our products by Mr. J. Chalmers in his report on an interesting case of Cerebral Paralysis, pp. 289-91.

The reference to which we refer occurs at the foot of p. 290, and in quoting the formula of "Tabloid" Bland Pill Compound No. 1 an unfortunate printer's error has occurred, the quantities of aloin, strychnine, and arsenious acid having been given somewhat ambiguously as "aa gr. $\frac{1}{3}$ dr." To make the matter quite clear we quote the correct formula:—

B Pil. ferrugin. (Blaud)	gr. 10
Pulv. capsici	gr. $\frac{1}{4}$
Aloini	gr. $\frac{1}{30}$
Strychninæ	gr. $\frac{1}{30}$
Acidi arseniosi	gr. $\frac{1}{30}$

Yours very respectfully,

BURROUGHS WELLCOME AND CO., per S. F. M.

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

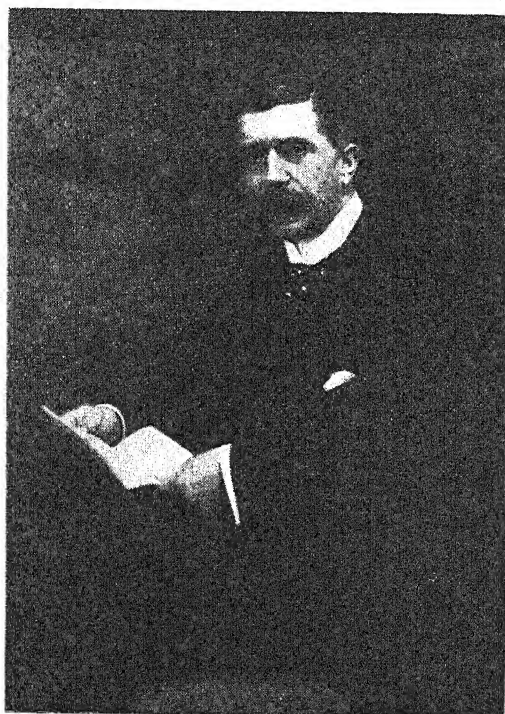
NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.



MR. JOSEPH HENRY CARTER,
F.R.C.V.S., F.R.S.E.

The newly elected President of the Royal College
of Veterinary Surgeons.

THE VETERINARY JOURNAL

AUGUST, 1913.

MR. JOSEPH H. CARTER, F.R.C.V.S., F.R.S.E.

THE unanimous election of Mr. Joseph Carter to the position of President of the Council of the Royal College of Veterinary Surgeons will have given universal satisfaction to the profession, especially the provincial practitioners, amongst whom Mr. Carter is deservedly popular.

A Lancashire man and a successful practitioner, Mr. Carter has for many years held positions of prominence in his native town. In Burnley he is a Town Councillor of well deserved popularity, whose word on matters pertaining to the welfare of the town, particularly the hygienic aspect, is much in request, and his position has been incontestably assured for a period of twelve years, as with one exception his election has never been opposed. His popularity amongst his fellow Councillors has been demonstrated by his election to the chairmanship or vice-chairmanship of numerous committees, and amongst his colleagues on the Royal College Council his geniality and soundness in opinions, when expressed, are too well known to need comment. It is his sixteenth consecutive year of service as a Member of Council, and this in itself is proof enough of his popularity amongst the rank and file of the profession. Brought up in the profession (his father was in practice at Bradford), Mr. Carter graduated at the New College in Edinburgh in 1882, and obtained his Fellowship in July, 1887.

In 1905 he was elected as a Fellow of the Royal Society of Edinburgh, and on two occasions has been President of the Lancashire Veterinary Medical Association. In Freemasonry he has held some of the highest offices, and with the reputation which he holds as an honourable and keen business man the veterinary profession may rest content that the hand which guides the helm of veterinary progress during the next twelve months is one to which it can be thoroughly trusted to bring the ship safely through the troublous period into which it appears still to be embarked.

Editorials.

THE PUBLIC ABATTOIR QUESTION.

At a recent meeting of the Council of Justice to Animals, a society formed to promote the humane slaughtering of animals used for food, one of the speakers, Lord Ernest Hamilton, brought forward a scheme for the erection of a model abattoir near London, in which it would be necessary for every butcher who used it for slaughtering cattle and other animals to use only one or other of the humane killers.

The subject is of interest to us because the time is certainly coming when England must fall into line with the Continental nations, and have decent abattoirs and a rational system of meat inspection controlled by properly qualified men. Almost every town on the Continent has this, and it is to our interest as a profession to support all schemes of this kind; in fact, we ought to figure prominently amongst the promoters and not stay away in the background.

The fact which strikes one the most is that private enterprise should be necessary to start such a scheme, when Government should really enforce it.

Lord Ernest Hamilton's scheme includes a model abattoir where butchers who use it can afterwards advertise the fact that all meat sold in their shops is from animals which have been killed painlessly, and thus educate the general public to refuse to deal at shops where antiquated and ineffective methods are still employed.

The Council of Justice, too, are taking up the question of licensed slaughtermen, and if only a law can be passed to make the possession of a licence necessary, a licence which will indicate proficiency in dispatching beasts expertly, fully one-half the unintentional pain inflicted in slaughter-houses at the present day will be done away with.

In all these questions we, as veterinary surgeons, are interested and should, indeed, take a leading part; for no body of men are so well qualified by their special training to pass their opinions upon matters of this kind as are the members of our profession.

"GILBERT AND SULLIVAN" AMONGST THE
VETERINARY INSPECTORS.

OUR power, or our powerlessness, are about to be demonstrated, for the appointment of an unregistered and unqualified man as "Chief Veterinary Inspector to the Local Government Board for Scotland" is about to be questioned. To appoint a man who is not a veterinary surgeon as "Veterinary Inspector," if not an offence against the law, should be made so just as much as if the man himself put upon his plate, or in his description of his qualification, anything which attempted to foist upon the public the idea that he was qualified in the science and art of the treatment of animal diseases; and anyone qualified as a doctor in human medicine who accepts such a title and position is acting in a manner derogatory to the tenets of a professional man.

The Council of the Royal College have the matter in hand, and they will signally fail in their duty if they do not bring the matter to the only possible conclusion, which is that no man shall hold the post of "Veterinary Inspector" unless he has previously become by examination a duly qualified veterinary surgeon. If a private individual started in practice and put upon his plate the words "Veterinary Inspector," he would at once be prosecuted and compelled to remove the description; much more should an official who holds an important appointment, which he is not qualified for, be compelled to alter his title or resign his billet.

The idea of a doctor of human medicine inspecting cattle, either alive or dead, and giving his opinion as one superior to the rank and file veterinary inspector is too absurd to need comment, and it would be laughable had it not become an accomplished fact, and thus too serious to allow to pass without dispute.

What would be said if a veterinary surgeon was appointed as "Chief Medical Inspector" to some asylum or to some County Council, and the inspectors of the rank and file were ordered to report their cases to him? We venture to say that there would be a rebellion at once, and we on our part must refuse at once to act. It is our duty, the duty of the whole profession, to refuse to "cover" an unqualified man; and the Council, whose protest

was so strong at the last quarterly meeting, look to the members of the profession who are veterinary inspectors in Scotland to strengthen their hands by refusing, one and all, to act in concert with (in other words, to "cover") an unqualified man.

We are sorry to write so strongly upon the subject, but we are very much surprised that a medical man, whose ideas of professional etiquette should be so well grounded, should consent to usurp or assume any position for which he knows he has no right and no qualification, and we sincerely hope that before the next issue of this Journal appears this "Gilbertian" situation will have been rectified.

General Articles.

THE CASTRATION OF OSTRICHES.

By STANLEY ELLEY, M.R.C.V.S.

Government Veterinary Surgeon, Oudtshoorn, Transvaal.

THE castration of ostriches was first undertaken and advocated by the writer in 1906. The objects which it was sought to obtain by the operation were as follows:—

(1) To check the indiscriminate breeding of inferior birds, which was at that time being largely practised, particularly in the Midland and North-Western Districts of the Cape Province, then the Cape Colony.

(2) To enhance the value of the feathers: (a) By the production of cleaner and less damaged feathers; (b) by increased weight.

(3) To tame vicious birds.

(4) To produce good foster-parents, which, whilst looking well after the chicks, would not become savage when fed along with the chicks on grain.

Moreover, it seemed most probable that if it proved possible to castrate birds with but a slight percentage of deaths from the operation the practice was bound to become general, since with no other class of stock would all the entire animals produced be allowed to remain as such.

It may now, after only seven years, be claimed that the anticipations then expressed have in every instance, though in varying degree, been realized. Indiscriminate breeding is

rapidly decreasing, and although this is by no means due entirely to castration, there is no doubt that the practice gave a stimulus to the breeding and classing of the superior birds, particularly in the districts above referred to.

That the feathers of capons are cleaner and less damaged than in the entire birds no one will dispute; while some farmers who kept careful records state that the weight of the white feathers alone increased as much as an ounce per bird per plucking after castration.

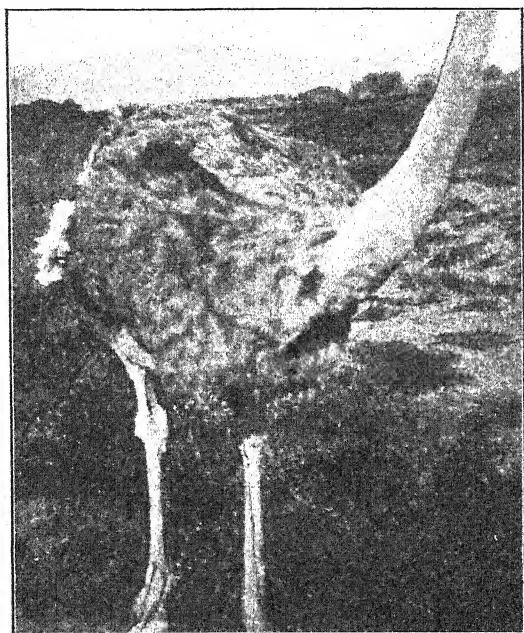


FIG. 1.—Spayed Hen. Note black feathers. Hen six months after castration. Observe the drab feathers, both on the upper part of wing and chest, commencing to turn black.

That all vice has been permanently removed from even the most savage and dangerous birds when castrated is well known practically on every farm where the operation has been performed, these having generally been the first birds selected for the operation. Again, those farmers who use capons as foster-parents would almost as soon lose one of their valuable breeding birds as one of their "Kuiken-Wachters."

The fact that seven years ago the operation was practically unknown, whilst to-day there are several men throughout the province who make a living by this one operation alone, is sufficient indication that the practice is becoming popular. Not only, as has been stated, has the weight of the feathers been increased, but no corresponding falling off in gloss or lustre,



FIG. 2.—Bird ready to be cast. Showing how the attachment is placed round legs. Ordinary plucking cap on head.

as was predicted by those opposed to the operation, has been testified to by the largest feather buyers in Africa.

The extraordinary phenomena of the feathers of the castrated hens assuming the characteristics of the male birds' feathers has

enhanced the value of such feathers even more than was contemplated.

THE OPERATION.

The bird having been starved for from twelve to twenty hours is cast in the following manner: An ordinary plucking cap is placed on the head, and a "riem" (a long rawhide strap with a ring attached to one end) or a soft rope is quickly placed round the legs in the figure of eight fashion, commencing with the left leg, the side on which the bird must fall; one man takes hold of

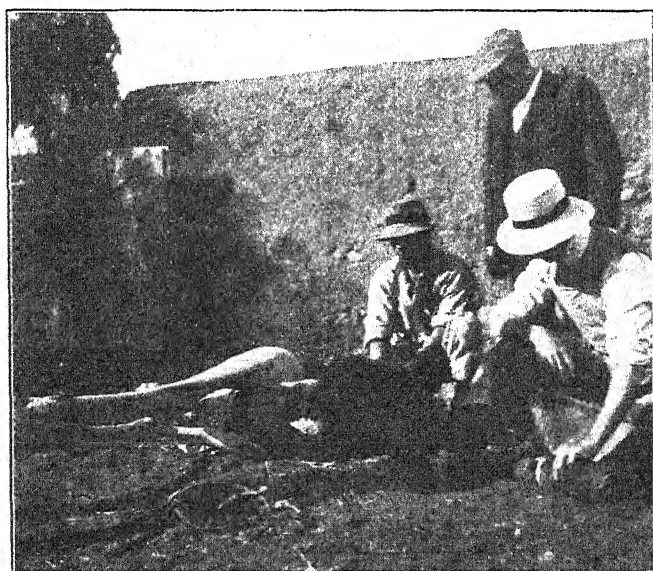


FIG. 3.—Ostrich castration. Bird cast and receiving the anæsthetic.

the left wing and a second of the tail, whilst the third takes the free end of the riem and pulls steadily, standing at a right angle to the bird's right wing. As the legs are pulled from under the bird those holding the wing and tail allow the bird to come steadily to the ground on its left side, which position is maintained throughout the operation. The plucking cap is now removed and the chloroform inhaler takes its place. A drachm to two drachms of pure chloroform are placed within the inhaler, this dose being repeated every two minutes until complete anæsthesia

is produced. This usually occupies six to eight minutes, depending to some extent upon the size and condition of the bird and the weather, strong winds causing an excess of air to enter the inhaler. The eyes being covered by the inhaler the conjunctival reflex cannot be taken. A simple method to ascertain if the patient is completely under the influence of the anæsthetic is to take hold of the right leg, lying uppermost, and attempt to pull the bird on to his back. This will invariably be resisted, even when a sharp slap fails to bring any response. The legs can now be entirely loosened, or otherwise each one must be held in a

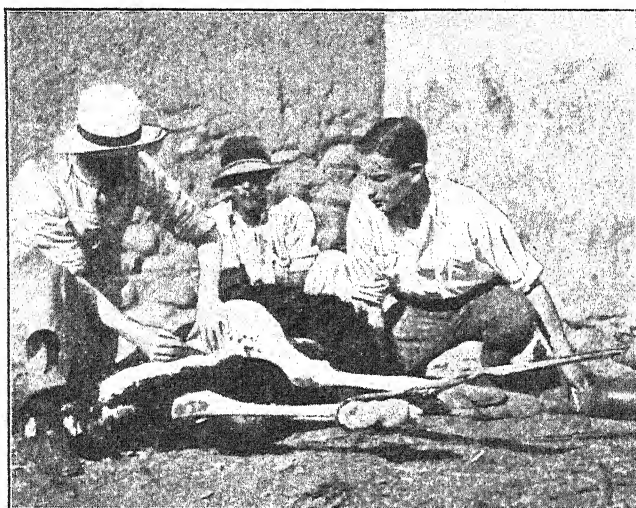


FIG. 4.—The site of the operation. Note position of legs.

separate riem, so that the right one may be taken forward as far as possible, which arrangement exposes the seat of the operation.

At the junction of the skin of the leg with that of the body a small pouch or cul-de-sac will be seen in the loose skin; this pouch is the spot from which the incision commences. Having well disinfected this area, an incision about 4 in. long is made through the skin, cutting backwards and very slightly downwards. The amount of subcutaneous tissue encountered between the skin and peritoneum will depend upon whether the birds have been grazing upon the veld or upon lucerne lands. In the former case only a very slight layer of the abdominal muscles, less than a

quarter of an inch in thickness, will separate the skin from the peritoneum, whereas in the lucerne-fed bird it is not uncommon to find an inch or more of adipose tissue covering the peritoneum. Having reached this membrane care must be taken not to injure the underlying gut when opening into the peritoneal cavity. Either the peritoneum may be grasped in the forceps and raised from the underlying structures, or otherwise a very slight opening may be made with the knife and the point of the finger inserted, when it may be readily raised and the opening enlarged to admit the hand, which is now lubricated and forced gently inwards in an upward and slightly forward direction, when the testicles will be located immediately between the hip-joints attached firmly along the dorsal surface on either side of the spinal column, a fold of mesentery separating them from each other.

In a bird which has not yet reached the breeding stage, that is, under about eighteen months, the testes are encountered as two firm elongated structures about the thickness of an ordinary lead pencil and about $1\frac{1}{2}$ in. long. It is at this age that it is advisable to operate. After a bird has reached maturity and has once paired, it is impossible to say in what condition the testes may be found; for, unlike any other animal or bird with which the writer is acquainted, the reproductive organs, and more particularly the testicles of the ostrich, enlarge during the breeding season, or whenever food is abundant, to an almost incredible size, again rapidly diminishing under adverse conditions. The largest testicles removed from an old breeding bird by the writer measured 7 in. long by 3 in. in diameter, weighing together 2 lb. 2 oz. Any condition between this and that described in the immature bird may be met with. The firm, characteristic feel of the testicles is, however, unmistakable, nor are there any other organs in this vicinity with which they could be confounded, the kidneys being large, flattened, hand-shaped structures, deeply embedded in the lumbar region. Having located them, the left or lower one should first be removed. An opening is made through the mesentery and the testicle grasped in the hand; it will be found to be attached along its dorsal surface, and this attachment is broken down with the point of the fingers, beginning at the posterior extremity. The tissues, except in an old bird, will be found to break away readily until the anterior extremity is almost reached. At this point the various vessels

enter and leave the organ, which should now be twisted until the connection is severed. The right or upper gland is then similarly removed. In cases where the testes are not developed to any great size, the one first removed may easily be retained in the palm of the hand whilst the second is removed, thus necessitating but one entrance and withdrawal of the hand from the peritoneal cavity. On the other hand, where the testes are very much enlarged considerable difficulty may be experienced in removing them from the abdominal cavity. In these cases the operator

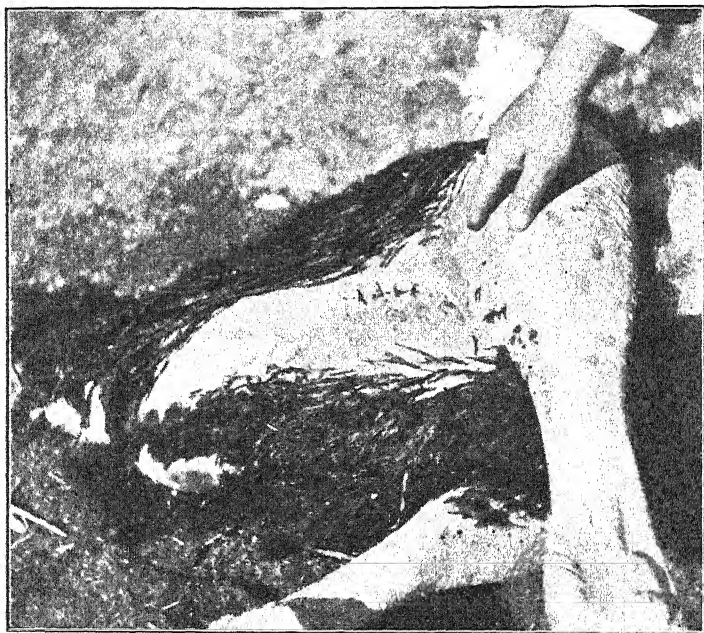


FIG. 5.—The operation completed.

brings the detached organ to the opening with the right hand, and passes a curved suture needle threaded with quarter of an inch tape through it with the left hand; it is then allowed to fall back into the abdominal cavity, the hand is withdrawn, and the testicle removed by means of the tape. In cases where the testes are enlarged and vascular and considerable hæmorrhage has taken place, the abdominal cavity should be swabbed out with a few pieces of boracic lint or cotton-wool before suturing the incision. It then only remains to suture the peritoneum with five or six

gut sutures, depending upon the size of the incision made and the skin and muscle layer taken together with the same number of eighth of an inch tape sutures, and the operation is complete.

THE FEMALE.

The hen is cast in a similar manner to the male bird, the site of the operation being identical. It will, of course, be remembered that only the right ovary is developed in birds. It is found in precisely the corresponding position on the right-hand side as the left testicle of the male, and it is, therefore, necessary to break through the fold of the omentum before it can be removed. The position and attach-



FIG. 6.—After the operation. The inhaler removed and the bird placed in its natural position.

ment of the stomach preclude the possibility of operating from the left side, which otherwise would be the most convenient in the hen bird. In the female it is only young birds of less than two years of age which should be operated upon. In those that have reached the breeding stage, the ovary and many of the eggs contained therein have attained such a stage of development that ovariectomy is impracticable. In hens under the age stated the ovary to the touch gives one the impression of a small bunch of small grapes, and consists of hundreds of unfertilized eggs varying in size from a pin-point to a small marble, all developing

from a common membrane. This membrane is attached precisely as the left testicle and is removed similarly, the forefinger being inserted under its most posterior extremity and gradually worked forward, when it will be found to readily strip away. Care must, however, be taken to remove it in its entirety, otherwise some degree of egg development may recommence. Having removed the ovary, the remainder of the operation is as in the male.

Before removing the chloroform inhaler the patient must be placed in the position natural to birds when lying, that is, on the chest, with the legs pulled out well on either side to prevent it falling on its side. The bird should then be left without anyone, and if possible without other birds in sight, in which case when it wakes up it will probably remain lying quietly until the effects of the chloroform have passed off, when it will get up of its own accord. Should there be other birds close to the place, or should it be frightened upon waking up, in attempting to rise hurriedly it may fall heavily, tearing out the stitches and causing rupture through the incision. This point should always be borne in mind and insisted upon, as, with the exception of a few deaths from careless administration of chloroform on an occasion when five hundred birds had to be operated upon in a limited time, the only fatalities encountered have occurred when the birds were too hastily caused to rise while still semi-conscious, and, after floundering about, fell and caused rupture.

The after-treatment consists merely in keeping the birds short of food for the first few days, after which the regular grazing may be allowed. There is no need to remove any of the stitches. The internal ones are quickly absorbed, and the outer tape sutures will be attended to by the bird himself, although I have occasionally found them in position as long as twelve months after the operation, apparently causing no irritation.

It may have been observed that no great stress has been laid upon asepsis, which is customary when treating upon intraperitoneal operations. This is not due to an oversight; for, although strict cleanliness is always practised, the fact is, that such a thing as peritonitis or septicæmia in any form is unknown in the ostrich. This is no doubt accounted for by the different composition of the blood to that of mammals. In close upon two thousand castrations, many of which have been in the nature of demonstrations where large numbers of farmers have placed

their hand within the peritoneal cavity to locate the testicles, no single case of peritonitis or other septic conditions have been known to result, and owners have now come to look upon the bird as safe when once he has risen to his feet after the operation.

POINTS IN THE ANATOMY OF THE FORE LIMB OF
THE LLAMA AS COMPARED WITH CAPRA AND
EQUUS.

By J. SHARE-JONES, M.Sc., F.R.C.V.S.,
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(Continued from p. 321.)

INNER ASPECT.

Bones.—No part of the ventral surface of the scapula is uncovered by muscle.

A more remarkable and unusual fact, however, is that the inner surface of the shaft of humerus is entirely clothed by muscle. This is due to the large size of the *caput parvum*, the muscular portion of which extends right down to the olecranon process; and also to the size of the *coraco-humeralis*.

The internal condyle of the humerus may be detected, as also the olecranon process, which is somewhat prominent.

Almost the whole of the inner surface of the shaft of the radius is unclothed (fig. iv, 9), the upper extremity only being concealed by a portion of the deep flexor muscle of the digit (fig. iv, 8).

The bones of the carpus are particularly well clothed and protected to a remarkable degree. The inner surface of the metacarpal bone, on the other hand (fig. iv, 15), is subcutaneous throughout its extent, but the bones of the digit are concealed.

MUSCLES AND TENDONS.

Subscapularis (fig. iii, 14).—Broad and covers the ventral aspect of the scapula.

Supraspinatus (fig. iii, 13).—A thin strip of this muscle extends beyond the coracoid edge of the scapula.

Teres Major (fig. iii, 17).—Relatively large and extends along the whole length of the glenoid border of the scapula.

Caput Magnum (fig. iii, 19).—Broad and somewhat triangular in outline.

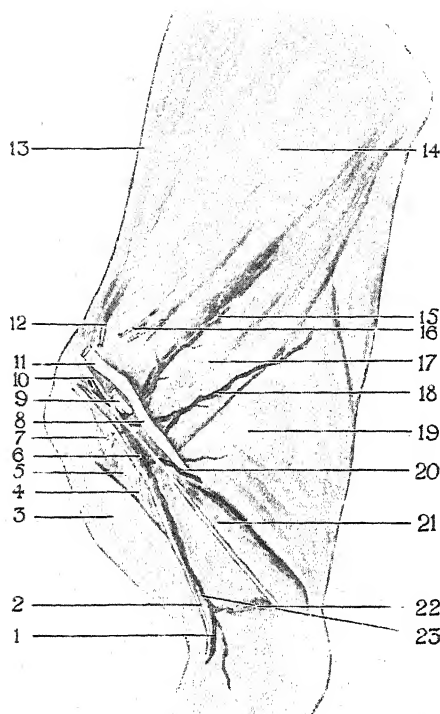


FIG. III.

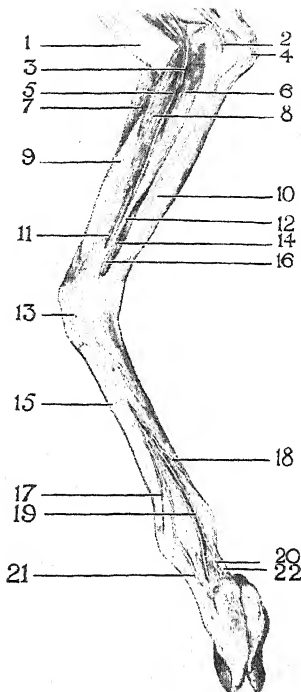


FIG. IV.

RIGHT FORE LIMB. INNER ASPECT.

1, Posterior radial artery; 2, median nerve; 3, biceps muscle; 4, nerve to coraco-humeralis; 5, coraco-humeralis muscle; 6, brachial artery; 7, nerve to biceps muscle; 8 and 11, musculospiral nerve; 9, circumflex nerve; 10, ulnar nerve; 12, supra-scapular nerve; 13, supraspinatus muscle; 14, subscapularis muscle; 15, long branch of subscapular artery; 16, subscapular nerve; 17, teres major muscle; 18, artery to latissimus dorsi; 19, large head of triceps extensor cubiti muscle; 20, deep humeral artery; 21, small head of triceps extensor cubiti; 22, ulnar artery; 23, musculocutaneous branch of median nerve.

RIGHT FORE LIMB. INNER ASPECT (*continued*).

1, Biceps muscle; 2, ulnar nerve; 3, median nerve; 4, summit of olecranon process of ulna; 5, posterior radial artery; 6, flexor metacarpi internus muscle; 7, extensor metacarpi magnus muscle; 8, portion of deep flexor of the digits (flexor perforans); 9, radius; 10, flexor metacarpi medius; 11, small metacarpal artery; 12, tendon of flexor metacarpi internus; 13, fibrous covering of knee; 14, large metacarpal artery; 15, metacarpal bone; 16, median nerve; 17, collateral digital nerve; 18, branch of communication to external plantar nerve; 19, common digital nerve forming collateral nerves of digits; 20, internal digital artery of external digit; 21, internal digital nerve of internal digit; 22, one of divisions of tendon of flexor perforans muscle.

Caput Parvum (fig. iii, 21).—This muscle calls for special remark. It is extremely large and its origin extends throughout the whole length of the inferior two-thirds of the inner surface of the shaft of the humerus. It is a bulky muscle, and between its supero-anterior border and the posterior border of the coraco-humeralis there is formed a channel down which the median nerve with its accompanying vessels runs. The muscular portion extends to the inner condyle of the humerus and its tendon is thus extremely short.

Coraco-humeralis (fig. iii, 5).—This is also a bulky muscle and it curves round more to the inner surface of the shaft of the humerus than in *Equus*. It is related, as stated, to the small head of the triceps extensor cubiti.

Biceps (figs. iii, 3, and iv).—This is relatively a very long and extremely powerful muscle. Its muscular belly extends throughout the whole length of the diaphysis of the humerus and its tendons are short and thick. It is related supero-posteriorly to the coraco-humeralis and inferiorly to the *caput parvum*.

It will thus be seen from what has been stated regarding the biceps and triceps extensor cubiti muscles, that the animal is capable of very powerful flexion and extension of the elbow-joint.

Extensor Metacarpi Magnus.—The inner portion of the belly of the muscle is represented on this aspect of the limb (fig. iv, 7). It has been fully described on the outer aspect.

Flexor Metacarpi Internus (fig. iv, 6).—This is made up of an extremely well-defined muscular strip somewhat delicate and strap-like in appearance. It has the usual origin from the internal condyle of the humerus. Its inferior tendon commences in the middle third of the forearm, so that it is relatively very long. It passes between the large and small metacarpal arteries, and running through a thecal canal on the inner side of the knee deeply seated passes to its insertion into the metacarpal bone.

The belly of this muscle is *not* related to the back of the radius, but rests through on the muscular portion of the deep flexor of the digit.

Flexor Metacarpi Medius (fig. iv, 10).—Relatively a much more powerful muscle than in most other animals. Its ulnar and humeral heads have strong tendons of origin which after a

length of only about an inch become united. The fibres then pass down the back of the common muscular portion and become continuous with the inferior tendon. This latter, though short, is very thick. It passes to the usual insertion.

It would thus appear that flexion of the carpus is effected chiefly by this muscle and that the other flexors, whilst certainly rendering it some assistance, rather tend to contribute to the elasticity of the movements of the joint.

Deep Flexor of the Digits or Flexor Perforans (fig. iv, 8).—In connection with this muscle there are one or two important points to be noted. It has a very much more extensive origin from the back of the radius than in most other animals. The inner portion of its belly extends to the proximal epiphysis of the radius and is visible on this aspect of the limb where it is represented in fig. iv. Moreover, this portion presents a groove on its posterior surface for the accommodation of the median nerve and its accompanying vessels, the posterior radial artery and vein. The muscle is here insinuated between the flexor metacarpi internus and the surface of the bone.

Its tendon passes through the carpal sheath and is not visible again until just above the metacarpo-phalangeal joints, since it is concealed by the fibrous tube extending down the metacarpal region from the knee and which has already been described. Splitting above this joint into two portions these pass one to each digit through the corresponding ring formed by the tendon of the superficial flexor. Emerging from these rings below the joint the divisions of the tendon are again observed as they pass to their insertion into the terminal phalanges.

Superficial Flexor of the Digits or Flexor Perforatus.—The tendon of this muscle also passes through the carpal sheath. It is not again visible until near the metacarpo-phalangeal joints, where it splits into two portions, one for each digit. These help to form the two rings referred to for the passage of the divisions of the tendon of the deep flexor.

THE ARTERIES.

The *axillary* artery rests in a loop formed by the ulnar nerve (fig. iii, 10) and a branch from the median. Its subscapular branch gives off a voluminous branch which passes up the glenoid border of the scapula between the teres major and subscapularis muscles (fig. iii, 15).

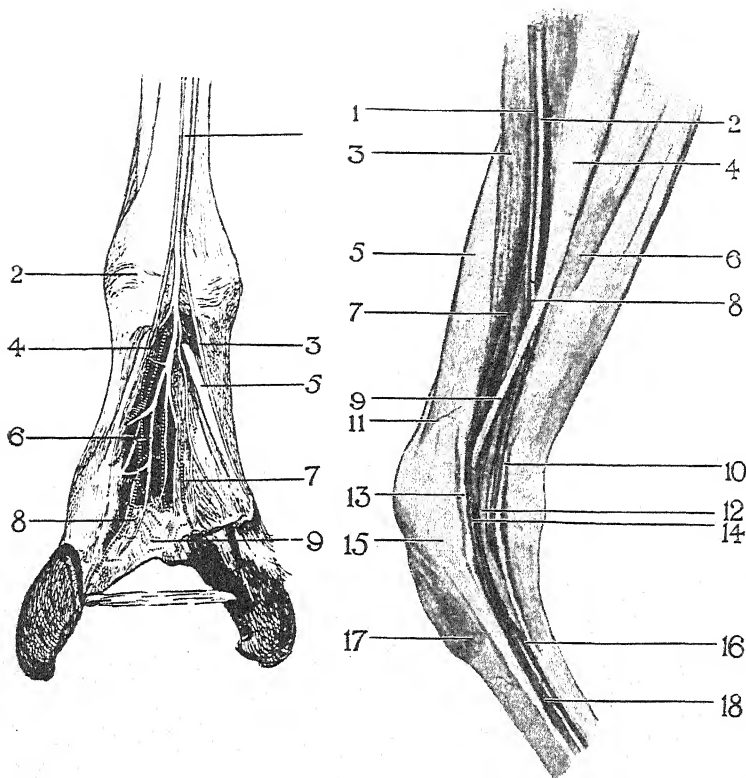


FIG. V.

FIG. VI.

FOOT OF LEFT FORE LIMB WITH DIGITS SEPARATED. ANTERIOR ASPECT.

1, Superficial anterior metacarpal vein; 2, fibrous covering of fetlock (metacarpophalangeal joint); 3, dorsal nerve of external digit (derived from ulnar nerve); 4, external digital artery of internal digit; 5, outer division of tendon of anterior extensor of digits (extensor pedis); 6, interdigital plexus of veins; 7, internal digital artery of external digit; 8, branches of "4" running to form interdigital plexus of arteries; 9, branches of "4" running to form interdigital plexus of arteries.

RIGHT KNEE. INNER ASPECT (DEEP DISSECTION).

1, Posterior radial artery; 2, median nerve; 3, portion of deep flexor muscle of digits (flexor perforans); 4, flexor metacarpi internus; 5, radius; 6, flexor metacarpi medius; 7, small metacarpal artery; 8, large metacarpal artery; 9, tendon of flexor metacarpi internus; 10, deep fibrous arch at carpus (incised edge); 11, superficial branch of small metacarpal artery; 12, accessory tendon of flexor perforans; 13, superficial fibrous arch at carpus (incised edge hooked forward); 14, small metacarpal artery passing beneath "13"; 15, fibrous covering of knee; 16, large metacarpal artery emerging from beneath accessory tendon of flexor perforans; 17, branch corresponding to internal dorsal interosseous artery; 18, anastomosis of small with large metacarpal artery.

The artery to the latissimus dorsi (fig. iii, 18) is also a very large vessel. Its arrangement and distribution, however, are very simple, and it is interesting to compare it with the very much contorted and branched vessel in *Capra*. Giving off a few collateral branches in the llama it passes directly across the *teres major* and *caput magnum* to the latissimus dorsi.

The Brachial Artery (fig. iii, 6).—As in other animals, this is the direct continuation of the axillary.

It does *not* lie on the surface of the humerus. As usual, it crosses the direction of the shaft of the bone obliquely, but it lies at first in a groove formed between the coraco-humeralis and the small head of the triceps extensor cubiti after leaving the common tendon of insertion of the *teres major* and latissimus dorsi. It then passes downwards between the *caput parvum* and the biceps, and divides into anterior and posterior radial arteries. It gives off a very small prehumeral branch, which passes outwards through the coraco-humeralis. A very large deep humeral branch was detached at the lower border of the tendon of the *teres major* (fig. iii, 20), which passed downwards and backwards beneath the ulnar nerve to disappear in front of the large head of the triceps extensor cubiti.

The ulnar artery (fig. iii, 22) was detached from the brachial just above the elbow-joint. It passed downwards and backwards along the inferior border of the *caput parvum* to the inner surface of the olecranon process.

The simplicity of the arrangement of this vessel and also of the artery to the latissimus dorsi is accounted for by the presence of a large, deep humeral artery.

The anterior radial artery passes outwards beneath the biceps and is not seen on this aspect.

Posterior Radial Artery (fig. iv, 5).—This is the main continuation of the brachial. It passes across the inner aspect of the elbow-joint with the median nerve. It runs down the forearm on the posterior surface of the flexor perforans and between this muscle and the flexor metacarpi internus and divides into large and small metacarpal arteries at the middle third of the forearm—at a much higher level, therefore, than usual. It is visible throughout the forearm if the flexor metacarpi externus and flexor perforans be gently separated. The main division passes beneath the tendon of the flexor metacarpi internus and is thus

continued through the carpal sheath as the large metacarpal artery (*Equus*).

The smaller of the two divisions, which corresponds to the small metacarpal artery (fig. iv, 11), passes downwards and almost immediately disappears from view. It is not, therefore, as superficially placed as in other animals, since it is covered at the knee by a layer of dense fascia, to which reference has already been made.

These vessels will be more fully described later in a deep dissection of the part, as also the digital arteries.

THE NERVES.

Median (fig. iii, 2).—This is very large. It leaves the brachial plexus and runs down in front of the axillary artery and subsequently in front of the brachial. It passes with the latter vessel along the groove formed at first between the coraco-humeralis and small head of triceps extensor cubiti and then between the latter muscle and the biceps. Passing over the inner aspect of the elbow-joint with the posterior radial artery it accompanies this vessel down the forearm. It does not thus come into relationship with the back of the radius, but is embedded between the deep flexor of digits and the flexor metacarpi internus.

It then runs through the carpal sheath and down the metacarpal region in the fibrous tube surrounding the flexor tendons, as the internal plantar nerve.

Immediately on leaving the plexus it gives off a branch which joins the root of the ulnar nerve. It is interesting to compare this communication with the ulnar with the contribution from the median which passes to the ulnar just above the knee in *Equus* to assist in forming the external plantar nerve. In the loop formed between this branch and the root of the ulnar nerve the axillary rests. In some other species, including *Equus*, this loop is formed between the two roots of the median.

In addition to the musculo-cutaneous branch and the nerve to the biceps and coraco-humeralis there is another branch detached in the arm which passes to the biceps (fig. iii, 4, 7 and 23).

Ulnar (fig. iii, 10).—This nerve is formed by a root from the brachial plexus with a contribution from the median nerve. It passes down behind the axillary and brachial arteries, crossing

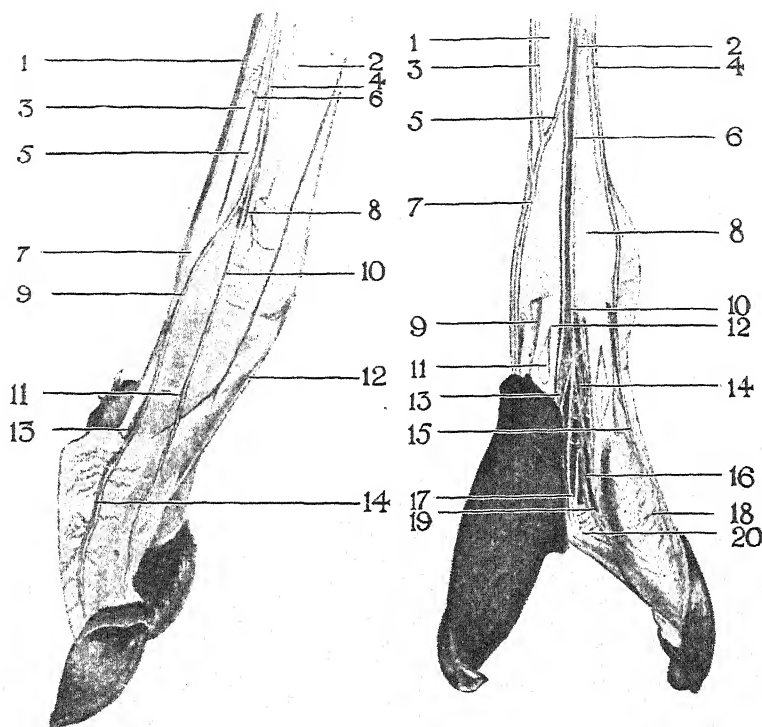


FIG. VII.

FIG. VIII.

LEFT LIMB—INTERNAL DIGIT—INNER ASPECT.

1, Large metacarpal artery lying on back of flexor tendons; 2, large metacarpal bone; 3, tendon of superficial flexor of digits (flexor perforatus); 4, internal collateral nerve of internal digit; 5, tendon of deep flexor of digits (flexor perforans); 6, superficial branches of large metacarpal artery distributed to flexor tendons and their sheaths; 7, fibrous tube at back of metacarpo-phalangeal joint; 8, superficial branches of common digital artery; 9 and 10, anterior and posterior divisions of "4"; 11, branch of internal division of common digital artery corresponding to perpendicular artery of pastern; 12, tendon of anterior extensor of digits (extensor pedis); 13, internal collateral artery of external digit; 14, internal collateral artery of internal digit.

FOOT OF LEFT FORE LIMB. POSTERIOR ASPECT.

1, Tendon of superficial flexor of digits (flexor perforatus); 2, large metacarpal artery; 3, external plantar nerve; 4, internal collateral nerve of internal digit; 5, branch of communication between internal and external plantar nerves; 6, division of internal plantar nerve (main); 7, external collateral nerve of external digit; 8, dense fibrous sheath at metacarpo-phalangeal joint; 9, artery to external plantar cushion; 10, common digital or interdigital artery; 11, outer division of tendon of flexor perforans; 12, outer division of tendon of flexor perforans; 13, internal collateral digital artery of external digit; 14, external collateral artery of internal digit; 15, continuation of "4"; 16, continuation of "14" in interdigital space; 17, internal collateral nerve of external digit; 18, superficial branches of internal collateral artery of internal digit; 19, external collateral nerve of internal digit; 20, interdigital plexus of arteries.

the deep humeral branch of the latter. It then inclines downwards and backwards on the surface of the small head of the triceps extensor cubiti muscle to the inner side of the olecranon process of the ulna.

In the forearm it splits into two portions, which were described on the outer aspect.

Circumflex (fig. iii, 9).—This is relatively a large nerve. It passes from the plexus outwards through a triangular space at the back of the shoulder below the long branch of the subscapular artery.

Musculo-spiral or Radial (fig. iii, 8 and 11).—This is an enormous nerve. It is relatively larger even than in *Equus*. It passes from the plexus downwards behind the circumflex nerve and then crosses the long branch of the digits as in *Capra*.

Suprascapular (fig. iii, 12).—This is a long slender nerve which takes the usual course.

Subscapular (fig. iii, 16).—This is in two slender filaments, which leave the brachial plexus and pass direct to the subscapularis muscle.

Deep Dissection of Knee (Inner Aspect).—Several interesting points were observed during the course of this dissection, many of which are illustrated in fig. vi. In this figure, 13 and 10 denote the incised edges of the two layers of the fibrous carpal arch, which was described when dealing with the fascia.

Upon hooking forward the edge of the superficial layer (13) the channel in which ran the vessel corresponding to the small metacarpal artery (fig. vi, 14) was fully displayed and the vessel was brought into view throughout the whole of its length (7 and 14). After being detached from the posterior radial (fig. vi, 1) it ran for a short distance on the surface of the deep flexor muscle of the digits (fig. vi, 3), giving off a small branch, which passed forwards and outwards between this muscle and the radius. It then crosses the tendon of the flexor metacarpi internus (fig. vi, 9), but immediately before crossing the tendon it detaches an articular branch which disappears in the interior of the joint. The position where this branch is detached is represented in fig. vi by a thickening of the parent vessel which is crossed by the line indicating the tendon (9).

A collateral branch is now given off which passes forwards, pierces the fibrous annular band and appears superficially on the

antero-internal aspect of the knee (fig. vi, 11), where it splits into two terminal branches which are distributed to the skin.

An incision through the deeper layer of the fibrous carpal arch revealed the interior of the carpal sheath when the lips of the incision were hooked apart.

The tendon of the flexor metacarpi internus muscle (fig. vi, 9) is observed to run obliquely downwards and forwards across the edge of the accessory division of the flexor perforans and then pass to its insertion by running beneath the small metacarpal artery.

In the sheath the large metacarpal artery (fig. vi, 8) lies alongside the tendon of the deep flexor of the digits and below the carpus emerges from the sheath on the inner edge of the tendon.

THE DIGITS.

The Arteries.—The large metacarpal artery or collateral artery of the cannon, at the middle third of the metacarpal region leaves the inner aspect of the limb and passes obliquely downwards and backwards across the edge of the tendon of the flexor perforatus. It then descends the back of the limb in the middle line and arrives at the interdigital space.

Immediately below the metacarpo-phalangeal articulation it splits into two divisions. The inner of these passes downwards along the outer edge of the inner division of the flexor perforans tendon. Near the upper extremity of the first phalanx it detaches a small branch which passes beneath the flexor tendons transversely and appears on the inner aspect of the limb (fig. vii, 11). This branch corresponds to the perpendicular artery of the pastern. It also gives off a slender branch, which ascends in a retrograde manner along the edge of the tendon of the superficial flexor and which was traced to the metacarpo-phalangeal joint.

Just above the distal epiphysis of the first phalanx this inner division of the large metacarpal (or rather its continuation, the common digital) artery bifurcates.

The inner portion passes beneath the flexor tendons and appears on the inner aspect of the internal digit, of which it forms the internal collateral artery (fig. vii, 14). This vessel runs in a wavy manner along the whole length of the remainder of the digit. It gives off a number of branches which pass forwards

and are distributed on the anterior aspect, and a still greater number which pass backwards and are distributed to the fibrofatty pad or cushion on the sole. These branches are represented in fig. vii. This division may be said to correspond to the preplantar artery of *Equus*.

The outer division forms the external collateral artery of the internal digit. It detaches anterior branches distributed to the digit. Its posterior branches present a most interesting arrangement, for they pass towards the middle line in the "webbing" between the digits, where they form a series of anastomoses with the corresponding vessels from the opposite digit (fig. viii, 20). A number of arterial arches are thus formed, and these give off a large number of small vessels which form a plexus between the digits. The whole of the terminal portion of the digit is thus surrounded by a network of small vessels and its blood supply is most profuse.

THE NERVES.

Ulnar Nerve.—The superficial division of the ulnar nerve (fig. ii, 7) passes downwards over the outer aspect of the knee and runs down the anterior aspect of the metacarpal region. At the bifurcation of the digits this division splits into two portions, and each of these runs along the dorsal aspect of one of the digits to its termination and constitutes its dorsal nerve.

Internal Plantar Nerve.—This large nerve, which is the direct continuation of the median, runs along the inner edge of the tendon of the flexor perforans. At the middle third of the metacarpus it gives off a large branch which passes downwards alongside the large metacarpal artery and inclines with it towards the back of the limb. It then leaves the vessel and, passing outwards, ultimately joins the external plantar nerve, which it provides with a considerable reinforcement.

Just across the metacarpo-phalangeal joint the internal plantar nerve gives off a long and slender branch, which is distributed to the inner aspect of the internal digit, whilst the main portion of the nerve follows the course taken by the internal collateral artery.

The external collateral nerve of the internal digit and the internal collateral nerve of the external digit are formed by the bifurcation of a branch of the internal plantar nerve which leaves

the latter just below the point of detachment of the branch of communication to the external plantar nerve. This branch passes down the limb to the inner side of the common digital artery to the interdigital space, where it forms the two collateral digital nerves as stated.

The External Plantar Nerve.—This is much smaller than the interior plantar. It is the direct continuation of the deep division of the ulnar nerve. From the division of the latter it runs through the carpal sheath and thence down the limb on the outer edge of the tendon of the flexor perforans.

At the metacarpo-phalangeal articulation it receives the above-mentioned branch of communication from the internal plantar nerve, and is then continued down the outer aspect of the external digit, to which it is distributed, and of which it forms the external collateral nerve.

General Remarks.—Unlike most other members of the Ungulata, the large nerves and vessels were found to be on soft structures throughout their course. In this connection the extraordinary development of the small head of the triceps extensor cubiti and the flexor perforans are particularly striking, since they afford a soft bed for the median nerve and the brachial and posterior radial arteries in those situations where in most other animals these structures are in direct relationship to the bones themselves (*e.g.*, *Equus* and *Capra*).

Another notable feature is the protection of the muscles and tendons by the very dense deep fascia, a remark which especially applies to the fibrous tube described for the passage of the tendon of the superficial and deep flexor muscles of the digits in the metacarpal region.

Although, as is well known, this animal is used in some countries as a beast of burden, it is somewhat surprising that its use has not become more general. In animals so used the parts which are most subject to wear and tear and are the most liable to injury are the limbs. Thus horses are frequently rendered unfit for work from paralysis of one or other of the big nerves of the limbs (*e.g.*, suprascapular, musculo-spiral, &c.), or injury to the flexor tendons in the metacarpal region.

It has been pointed out above how unusually well protected and supported these structures are in the llama.

LOCAL ANÆSTHESIA.*

BY VETERINARY-COUNCILLOR VAETH.

Heidelberg.

I. HISTORY.

The endeavour to allay pain is as old as mankind itself. In fact, we find a few statements about analgesic methods among the old civilized nations of Asia and Europe. Thus the ancient Greeks, and after them the Romans, used pain-allaying substances such as the poppy, Indian hemp, henbane, mandrake root, and mandragora; and in the Middle Ages the same ideas prevailed. Cataplasms of the above-mentioned substances were placed on the field of operation, or so-called sleep sponges soaked in the juices of such narcotizing plants were applied. Also to us older veterinary surgeons the use of soothing baths and poultices is not foreign, although in the present student's day these are only ordered in painful bone and foot diseases. But they have all only incompletely fulfilled their avowed object and have gradually passed into oblivion, and with the discovery and perfection of general narcosis they have been more and more discarded. But, however the latter may be valued, it still has certain resultant disadvantages and dangers.

Time and again means and methods have been sought to enable local anæsthesia to be carried out. To the first and oldest belongs compression of the nerve on its bony foundation, whereby an interruption of the nerve conductivity can be produced, such as we experience, for example, when our limbs go to sleep. Neuralgic pains may be allayed by beating and pressure on the nerves. Also extreme cold is capable of making the nerve endings as well as the trunks non-excitabile. This circumstance was taken advantage of by the doctors in the campaigns of Napoleon I. On this principle rest also the methods of James Arnott (1849) by means of application of salt and ice solutions to make a region of skin painless, the cold produced by the evaporation of ether of Richet (1858) and the ether spray of Richardson (1866). Cold anæsthesia, however, is actually only limited to the skin, and hence inadequate. Another, but also incomplete, method consists in rendering a part bloodless by ligaturing a blood vessel, since suitably used along with cocaine. Finally,

* From *Deutsch. tierarzt. Woch.*

also the electric current (the so-called Le Duc's current) has been employed for this object.

These methods were used until Koller (1884) made his communication on cocaine anæsthesia in the eye. It teaches the possibility of an elective influence of the sensible nerve apparatus by chemical substances, and on this possibility to narcotize the sensitive nerves transiently and without injury by certain drugs local anæsthesia depends. Since cocaine is the point of origin for all preparations which are used to-day to dull pain, and since through it all major studies on local anæsthesia have been made, so it shall serve as the basis of our discussion.

Cocaine is obtained from the leaves of the coca plant growing in South America, where its partly exciting and partly calmative effects have long been known. The leaves were brought to Germany by Scherzer, and Niemann and Lossen produced cocaine from them in Wöhler's laboratory in 1860. Twenty years elapsed before the knowledge of its pain-quelling properties penetrated so far with the medical fraternity that they resolved to use it. About the year 1884 one heard of its success in eye operations, and about the same time the first notices appeared on the subcutaneous employment of cocaine in surgical operations in Germany, Austria, and America. In the last-named countries it was chiefly Corning who proved the increased effect of cocaine in tissues devoid of blood, and hence the possibility to produce effect by injection of highly diluted solutions (0.25 to 0.5 per cent.); thus also the possibility of interrupting the conductivity in sensitive nerves by cocaine injections.

After him it was the Frenchman Reclus, who at the end of the 80th year used cocaine largely as a pain alleviator, until at the commencement of '90 the Berlin surgeon Schleich made known the infiltration anæsthesia named after him. It consists in influencing the sensible nerve endings of the field of operation itself by anæsthetizing solutions.

Next to this terminal anæsthesia Braun's method had great significance, and was known as regionary or conduction anæsthesia. It is really only the practical outcome of Corning's work, and consists of the fact that by injection of anæsthetics in the neighbourhood of conducting nerve trunks an interruption of conductivity of this nerve trunk is produced whereby the peculiar field of operation remains intact. A further method, a

subdivision of conduction anæsthesia, is the circular anæsthesia of Hackenbruch, whereby the whole field of operation is encircled by injecting anæsthetizing solutions, and thus the conductivity to the same is completely interrupted. Braun has also used *suprarenal preparations* as an addition to the anæsthetic, and thereby reduced the danger of poisoning. A further advance is to be expected from Bier's venous anæsthesia, in which, at the arm or leg, between two tourniquets, a $\frac{1}{2}$ per cent. novocaine solution is injected into a vein. In this way an anæsthesia complete enough to perform major operations, such as resections and amputations, peripherally from the tourniquets, without causing any pain, may be produced. Also here chemistry has succeeded in producing a compensating preparation for the poisonous cocaine, and as a result *novocain*, in spite of its rather powerful effect but relative non-toxic character, has come much into vogue, so that now cocaine, except for analgesing the mucous membrane and the eye, is almost wholly discarded. In quite recent years the chemist has produced *suprarenin* synthetically.

II. LOCAL ANÆSTHESIA, ITS EFFECT AND DOSAGE.

To explain principles we will again take cocaine and treat of it as an example. Cocaine is a white, colourless, odourless powder of bitter taste, which is easily soluble in water and alcohol. Its peculiar effect depends on a pure chemical process, on its affinity for the protoplasm of the tissues, and above all for that of sensitive nerves, whereby the susceptibility to pain as touch and pressure sensation is very considerably diminished. The motor nerves are so little influenced that the cocaine solution scarcely comes into consideration as a rule with them at all. There is an elective effect on sensitive nerves which originates a varied reaction in single kinds of nerve fibres. Also the reflexes of the nerves of the mucosa remain unaffected, as, for example, those of the conjunctiva. This is of great significance for operations on the larynx, nose, &c.

The central nervous system on the contrary shows a very great susceptibility. A considerable quantity of cocaine gaining access to the general circulation produces its effect primarily on the brain and spinal cord, secondly on the heart; on the other hand, one notices nothing of an increase of irritability of the

peripheral sensitive apparatus. This can also only be produced by local application (maximal dose for man 0.05 grm. per dose; 0.15 per diem).

Besides the nervous elements in the tissues the vessels are influenced by the local cocaine effect. They contract, and the blood contents of poisoned tissues are thus considerably diminished. This has two advantages: firstly, cavities covered with mucous membrane are easily accessible, and secondly, the anæmia supports the effect, whilst it retards the resorption of the cocaine from the tissues, and it arrests it longer at the place of its application.

The great significance of the different blood contents of the tissue for the carrying out of cocaine anæsthesia shows itself, for example, in that anæsthesia of the eye in inflammatory hyperæmia is much more difficult to carry out than where this condition is absent.

Schleich has practically, and Morel experimentally, proved that a quantity of cocaine injected in concentrated solution produces severe symptoms of poisoning, whereas a dilute solution is well borne. One can inject double the maximal dose in 0.1 per cent. solution without danger, whilst a small fraction of a 5 per cent. solution produces the severest toxic symptoms and may lead to death.

In cocaine poisoning the patient immediately after injection is attacked with giddiness and syncope, the skin becomes blanched, the pupil dilated and fixed, the pulse small and quick. Thumping heart-beats and increased blood-pressure occur, the temperature of the body rises. At first one notices clonic spasms, then paralysis and lack of sensation, the reflexes vanish, and finally coma and death occur. (Observations on the dog.)

In slight cases the invalid recovers after a few seconds; in severe cases marked symptoms or irritability set in, having an intoxication-like character. Death often occurs quickly and unexpectedly from paralysis of the respiratory centre.

In order to avoid poisoning we must—

- (1) Employ solutions as dilute as possible that will nevertheless produce complete anæsthesia.

- (2) Seek to retard the resorption of the cocaine into the circulation.

In reference to the first point experience teaches that 1 to 2

per cent. solutions are well borne in veterinary practice, and in union with the hereafter-mentioned drugs retardation of absorption is accomplished. A maximal dose in horses, cattle, and dogs has never been announced in literature to my knowledge. Vebele says: "Symptoms of poisoning in horses and cattle occur after doses of 0.0007 per kilogramme (0.3 *in toto*); in dogs after 0.0175 per kilogramme (0.1 *in toto*), and upwards. For the rest many animals are more susceptible than others. So long as the introduction of cocaine into the blood and its poison-spreading effect are held in check great quantities of cocaine may be employed without danger to the organism. As a rule, however, as Fröhner asserts, quite small doses suffice. Thus one employs 3 to 5 per cent. solutions to produce analgesia on mucous membranes, and for subcutaneous application, as we shall see later on, 0.5 to 1 per cent. solutions suffice.

Great difficulty stands in the way of its employment on serous tissues which have great powers of resorption. In joints and the bladder one injects quite dilute solutions (0.1 to 0.2 per cent.). In quite young animals and children, as well as in anæmic and cachectic subjects, cocaine should be excluded. With reference to the second point, the retardation of the resorption of the anæsthetic, the following is valuable:—

Braun, as already stated, has conjoined suprarenin preparations with cocaine solutions in order to avoid resorption, and consequently to do away with any danger of cocaine poisoning. We will therefore discuss this preparation and its effect.

To-day the synthetically produced white-looking suprarenin (adrenalin) is almost solely used either in solution of 1:1000, or as an addition to tablets. It is worthy of note that this solution should show no rose colour, because such a solution is not only non-effective, but by decomposition has become poisonous. On this account one uses that prepared by the manufacturer in small bottles and protects it from the light.

The effect of suprarenin (adrenalin, suprarenin, &c., always produce an irritability of the sympathetic; they attack only those nerve endings which belong to the sympathetic system) consists, according to experimental researches, of a contraction of the muscularis of the heart as well as also of the smooth muscle of the whole body, especially of the median and small vessels. Thereupon a narrowing of the vessels at the place of injection

occurs, and then anæmia, together with a retardation of local circulation—consequently a local limiting of resorption of the anæsthetic, and so not only a decline of danger from poisoning, but also an increased local effect and a longer continuance of anæsthesia.

Suprarenal preparations have no analgesic effect, but as a result of their strong vessel contracting peculiarities the field of operation may be rendered bloodless and visible. On this account we must never forget that these preparations injected in great quantity are very poisonous and may cause death under symptoms of lung cedema, convulsions, and paralysis. They should, therefore, only be used in small quantities and dilute solutions added drop by drop. In the novocain tablets of Merck, and the sterile solutions of Bengen, this addition has already been made. In general, according to Schlesinger, 1 to 4 drops in 10 c.c. of solution for infiltration and circular anæsthesia, 1 to 2 drops to 1 c.c. for interruption of conductivity of great nerve trunks, may be employed.

If contrary to expectation cocaine poisoning does occur—I myself have experienced it—the body is put in the horizontal position with the head lower; also cold water is sprinkled on the head. In severe cases caffeine or camphor is subcutaneously administered, strong friction is applied to the skin, and eventually artificial respiration is carried out.

In order to avoid poisoning as much as possible, cocaine has for some time been made up with other preparations. Of all new drugs novocain has proved the best, so that cocaine, except for analgesing mucous membranes and the eyes, is hardly ever used.

Novocain is a white crystalline powder that may be heated to 120° F. without decomposing, and is quite soluble in water and alcohol. It causes no irritability and tissue injury, and its toxic effect is seven times less than that of cocaine, but its effect is also somewhat weaker, and bears a relation of 1:2 to that of cocaine. We can therefore use it in double the doses of cocaine. But since the anæmianizing effect of cocaine is absent, we must add suprarenin to it if we desire this effect. By so doing we increase its analgesic effect considerably.

Besides, it is sterilizable like all synthetic supplementary preparations.

III. THE METHODS OF LOCAL ANÆSTHESIA AND THEIR EMPLOYMENT.

Apart from anæsthesia of the skin by cold by means of ethyl chloride, which is suitable for slight affections and operations in the skin, three chief methods are recognized:—

- (1) Superficial anæsthesia.
- (2) Infiltration anæsthesia according to Schleich.
- (3) Conduction anæsthesia.

Recently Bier has produced anæsthesia by injection of novocain into the veins between two tourniquets (the area being previously deprived of blood by compression bandages), so-called venous anæsthesia, but to my knowledge this method has not been used in veterinary practice, but nevertheless it might be useful in small animals.

(1) *Superficial Anæsthesia*.—Towards the end of 1880 we first obtained knowledge of cocaine and its anæsthetizing effect on the conjunctiva was especially proclaimed. In this region, and to do away with pain in the external mucosa as well as in cavities, it has held its position up to the present in spite of the concurrence of other methods.

Terminal anæsthesia in the conjunctival sac does not extend beyond the mucosa, and may be attained with small doses. A 2 per cent. solution without suprarenin is generally used. Two to three instillations of 5 to 10 drops are necessary. Lack of sensibility occurs quickly as a rule, say in two to three minutes. In cattle analgesia is not produced with cocaine, and the matter of an effective analgesia in this animal is a suitable object of research for a candidate for a doctor's degree. For mucous membranes we still use strong concentrations (10 to 20 per cent. cocaine solution), painting with a camel hair brush or application of soaked tampons and the like. However, with the size of the resorption surface the danger of poisoning increases. In hyperæmic or ulcerous surfaces the danger is the greatest.

To make serous cavities, joints, or hydrocele sacs painless one first infiltrates 0·5 per cent. novocain solution and suprarenin at the point of injection, and eventually injects this solution into the joint to the full, after evacuation of the fluid in the cavity.

After the lapse of ten minutes one can not only inject medica-

ments, but also correct contractions if they are only of a reflectory nature and there are no deformities.

(2) *Infiltration Anæsthesia according to Schleich.*—By this we understand an infiltration of the region of operation with certain solutions according to Schleich, by which under pressure the tissues are much œdematized artificially. First the skin to the extent of the incision and the subcutaneous cellular tissue immediately beneath it are infiltrated, then gradually the deeper layers, layer by layer, and indeed with great quantities of the fluid. Three solutions have been chiefly used recently.

<i>Solution 1.</i>	<i>Solution 2.</i>	<i>Solution 3.</i>
0·1 cocaine	0·05 cocaine	0·01 cocaine
0·1 alypin	0·05 alypin	0·01 alypin
0·1 sod. chlor.	0·2 sod. chlor.	0·2 sod. chlor.
100·0 distilled water	100·00 distilled water	100·00 aqua dest.

Schleich lays stress on 0·2 per cent. salt solution (recently 0·8 salt solution has been used, since it causes no tissue injury), which he considers to be an anæsthetic. Besides, by the artificial œdema anæmia is produced, and by pressure compression of the nerve endings. According to him the cocaine acts in the latter way, whilst others consider the last constituent is the effective agent in his solutions. Infiltration anæsthesia is not practicable in inflamed tissues, since it produces intense pain in this condition. In such cases we turn to the third method.

(3) *Conduction Anæsthesia.*—Discovered by Corning, was practised by Braun and Hackenbruch, and to-day plays the first rôle. By it one understands a method in which a certain field of operation is made painless by anæsthetization of nerve trunks leading to the brain and spinal marrow and by interruption of the sensible conductivity. This happens when we inject the means in the neighbourhood of nerves, the injection reaching them by diffusion. By the injection the nerve conductivity is interrupted, and thus the extent of the region anæsthetized.

Here we must note the histological fact that the nerve sheaths of the five nerve branches are thin, and towards the centrum add proportionately to the strength and thickness of the nerve trunks. With strong protective coverings the difficulty of anæsthetization and the concentration of solutions increases. Therefore where it is possible we seek to make a field of operation painless by anæsthetizing the smaller nerve trunks.

For this object the circular anæsthetization of Hackenbruch is suitable. In this case the tissue round about the field of operation is infiltrated with solutions so that the conductivity of the nerve trunks supplying all the field of operation is interrupted. To accomplish this we use large quantities of fluid. In order to avoid poisoning we also take 1 per cent. novocain solutions and use, according to size of animal, 50 to 100 c.c. in horses, and 10 to 25 c.c. in dogs.

Where circular anæsthesia is not sufficient we must seek out especially the strong nerve trunks and interrupt their conductivity by strong solutions and copious addition of suprarenin. Formerly it was considered important to inject over the course of the nerve, but I have noted that an injection in its neighbourhood will accomplish the same object. Two per cent. novocain solutions with suprarenin usually suffices.

Conduction anæsthesia, according to Schleich, has the advantage that after the onset of painlessness the operation need not again be interrupted, greater painlessness results, and the unchanged tissues enable a better recognition to be made between healthy and diseased structures.

Finally, we may call attention to Vdriski's method of diagnosing lameness by conduction anæsthesia and the so-called spinal marrow anæsthesia produced by injection of cocaine solutions into the lumbar sac. I will only here call attention to their danger and by-effects.

(4) *Venous Anæsthesia.*—For four years Bier has practised this method. It consists of injection of anæsthetizing solutions under pressure, between two blood-expelling bandages, into the veins of an extremity; within a very short time complete painlessness is produced.

We have already stated that our literature contains no experiences of this method, but I myself am convinced that it might be used on the hind limbs of dogs.

(To be continued.)

Clinical Articles.

NOTES ON AN OUTBREAK OF HORSE SICKNESS, CONNECTED WITH THE PRESENCE OF A LYPER- OSIA AS A POSSIBLE TRANSMITTER.

BY CAPTAIN A. J. WILLIAMS, F.R.C.V.S.

Army Veterinary Corps, Secunderabad, India.

In the *Journal of Tropical Veterinary Science*, vol. iii, No. 1, of 1912, there is an interesting article on "Biting Flies and Surra," by Mr. A. S. Lees, M.R.C.V.S., Veterinary Officer Investigating Camel Diseases in India.

Having met with an outbreak of horse sickness, apparently transmitted by a species of lyperosia, under conditions very similar to those mentioned by Mr. Lees in connection with the transmission of surra by the same fly, these few notes may be of interest.

In November, 1908, I was S.V.O. with the Nyima Expedition in the Gebel Sub-Province of Kordofan. The troops returning to Khartoum arrived at the base, Dilling, on November 21, among them being half a squadron of Egyptian cavalry, mounted on Arab horses. The horses were very fit, and there had not been a death since they marched out from Dilling at the beginning of November.

On the morning of November 22 one of the local police horses was reported very ill, and was found to be dying from horse sickness, acute pulmonary form. This animal had not been with the force.

The following day a mule belonging to the Survey Department died at 12 p.m. Condition same as above case. This animal had been in Dilling three weeks. Both these cases were typical horse sickness, acute pulmonary form.

November 28.—The first case among the cavalry horses appeared this morning. The animal was treated for very severe tympanitic colic on November 6 at a camp about five miles from Dilling, and as the force was moving camp on the 10th the animal was sent to the base, being unfit to march.

This turned out to be a typical case of the blue-tongue form. Twenty-four hours after the first symptoms appeared the animal was in a dying condition, and was destroyed.

The primary symptoms were as follows: Refusal of food, sub-normal temperature, lips swollen, mouth congested, salivation; later the swelling extended over the head, like a case of purpura hæmorrhagica, tongue enlarged and purple, whole oral cavity a purple colour, eyelids much swollen, and hæmorrhage from the conjunctiva.

November 29.—Another cavalry horse taken suddenly ill at 11 a.m. Non-painful swelling near side of face, swelling over the eyes and along the jugular furrow, tongue purple, ropy salivation, quids hay. Temperature $103^{\circ}20$ F. At 2 p.m. temperature 105° F.; 4 p.m. temperature 104° F., swelling increased, conjunctival mucous membranes scarlet colour. At 6 a.m. the following morning the animal was in a dying condition and was destroyed.

November 30.—It was decided to move the remainder of the horses, together with some locally purchased ones, to El Obeid, a distance of about ninety miles, and they marched out in the afternoon. An Egyptian veterinary officer at El Obeid took over veterinary charge.

Fifth Case at Dilling.—An officer's charger was isolated well away from all other animals on November 23, showing symptoms of strangles. On December 1 a large strangles abscess was opened, and the animal was doing well.

On December 7 the animal was found to be very ill. Temperature $106^{\circ}5$ F., conjunctivæ injected, and petechial blotches present, Horse sickness suspected.

December 8.—7 a.m., temperature 101° F.; 5 p.m., $104^{\circ}20$ F. Pneumonic symptoms present, both lungs affected, respiration much accelerated and laboured.

December 9.—7 a.m., temperature $100^{\circ}20$ F., yellow discharge from both nostrils, grunting, respiration 40, heart sounds muffled, and very rapid beat, dulness on percussion over lower third of chest on both sides; animal very weak. 3 p.m., died.

December 14.—Report received from El Obeid, dated 9th inst., saying that five cases had occurred among the horses which marched from Dilling on the 30th ult., as follows: December 6: One case, died in six hours. December 8: One case, found ill in the morning, and died same day. December 9: Three cases, all died after a few hours' illness.

December 15.—The sixth case occurred at Dilling. My charger reported ill at 11 a.m. Temperature $105^{\circ}40$ F.; symptoms of blue-tongue form. Died 5 p.m. next day.

December 16.—Another case this morning. At 11.30 a.m. an officer's charger found ill. Temperature 105.4° F., dull, off feed, staring coat, blowing. This pony was kept under a straw shelter some distance from other animals.

December 17.—Animal very ill, slight amber coloured discharge from the left nostril, swelling in supra-orbital fossa, pulse very weak, temperature 102.6° F., abdominal pain. 9 p.m., constant abdominal pain, pulse almost imperceptible. 12 p.m., died.

December 18.—News from El Obeid saying there had been eight deaths from blue-tongue, and another animal not expected to live.

December 21.—Arrived at El Obeid. Found the last case was on the 12th inst. Horse No. 15, present condition as follows: Temperature 103° F., lungs in a bad state, legs much swollen, especially from the knees down, animal very dull and weak.

A fresh case occurred to-day at 12 a.m. Horse No. 101, temperature 106° F., dull, and quidding hay. 5 p.m.: Temperature 104° F., extensive bulging swellings over the eyes, eyes appeared pressed forward with great tension in the chambers, conjunctival mucous membrane scarlet, upper lid partly erected.

December 22.—No. 101. Stertor, hæmorrhage from conjunctival mucous membrane, pulse weak, pulmonary symptoms, animal in a very bad state, died following day.

December 24.—Horse No. 15 taken ill on the 12th inst., and seemed a hopeless case. Is now improving. Milk and eggs and stimulants given.

This animal made a good recovery, and after some time at El Obeid on tonics and special feeding was sent to Khartoum to rejoin the unit. This was the only case that recovered.

There were no cases among the horses purchased locally.

Remarks.—The course of the disease, symptoms, and *post-mortem* appearances were typical, identical with those described in an article on "South African Horse Sickness," by the late Captain J. F. Coley, in THE VETERINARY JOURNAL some time ago.

There was little chance of treatment, as the disease ran a rapid course in most of the cases. Intravenous injection of pot. iod. was tried in the case which occurred on December 16, but it had no effect.

There are several points of interest in connection with this outbreak, more especially regarding the conditions under which the disease occurred, and the probable method of transmission.

The country around Dilling is sandy, desert-like, and during the dry season water is obtained from wells about 60 ft. deep. Horse sickness is well known to the Arabs in the surrounding country, appearing as usual with the first rains, and disappearing, as a rule, when the cold weather has set in. They call the disease "Nigma," because the horse sickness season coincides with the appearance of a certain star. They are so superstitious about it that they float some bright object on the water where they take their animals to drink, thereby hoping to prevent the disease by reflecting the light of the star, which they consider is connected with the evil results.

On inquiries being made, it was found that several cases had occurred among the Arab horses in the vicinity of Dilling in November and December, and they all said it was most unusual to get cases so late in the year.

The important point is that there were no mosquitoes and no biting flies to be found, except a *lyperosia*, which I think was the species known as "*Lyperosia minuta*, Bezzi," the same as mentioned by Mr. Lees. They were very numerous around the wells and in the horse lines. They attacked the horses in large numbers, and drew blood in pin-like points.

The cases occurred at intervals of from six to ten days, as follows:—

At Dilling			At El Obeid			Disease contracted at Dilling and appeared after arrival at El Obeid
1st case on November 22			5th case on December 6			
2nd	"	23	7th	"	8	
3rd	"	28	8th	}		
4th	"	29	9th				"	9
6th	"	December 7	10th	}		
12th	"	15	11th			"	12
13th	"	16	14th	"	21	

The horses arrived at El Obeid on December 3, and judging by the period of incubation in the other cases, it appears that in the 5th, 7th, 8th, 9th and 10th cases the disease was contracted at Dilling, but the 11th and 14th cases were infected at El Obeid.

As it was extremely probable that some horses were infected prior to their leaving Dilling, the following precautions were taken on their arrival at El Obeid:—

(1) The animals were picketed out a mile away from all other animals, with plenty of space between the lines.

(2) The water for them was carried from wells on camels.

(3) Smoke was kept going through the lines from smouldering fires on the windward side.

(4) The temperature of all the horses taken three times a day. Any animals showing a rise of temperature were immediately segregated half a mile away from the lines. They were constantly watched, and if any animal refused his feed or showed any signs of dulness the temperature was immediately taken.

It was not known that lyperosia existed at El Obeid, but as the conditions were similar to those at Dilling, and there was every chance of some cases occurring among the animals owing to infection previous to leaving Dilling, if lyperosia did exist the immediate segregation of any animal showing a rise of temperature, at a distance of half a mile from the lines, was thought to be the best precautionary measure, thus moving the centres of infection beyond transmitting range from the healthy animals.

Lyperosia were found at El Obeid in the vicinity of the lines, and this probably accounts for the two last cases which undoubtedly became infected there. The lines were on sandy desert country, and the only water was in deep wells over a mile away. There were no mosquitoes, or any biting fly except the lyperosia.

There appear to be good grounds to suspect this outbreak as one due to direct transmission by lyperosia, and the disease, as in several other recorded cases, occurred in a desert, waterless country, with symptoms identical with those seen in the South African horse sickness.

As far as I am aware there has not been any previous record of an outbreak of horse sickness in which the character of the outbreak pointed to direct transmission of the disease by lyperosia, in the absence of other biting flies or mosquitoes, and it will be interesting to know whether veterinary officers at present serving in the Sudan have met with the disease under similar conditions.

FIVE CASES OF MUSCULAR RHEUMATISM.

BY CHIEF VETERINARY-SURGEON ANGER.

IN June of this year, of ten horses of heavy breed which had taken part in night exercise, five exhibited the following symptoms: Profuse patchy sweating, stiff gait, especially of the hind quarters. The steps were short and cautiously taken; two patients could scarcely move from the place; one patient at the commencement of movement could not lift up the off hind leg, but kept it markedly flexed; the muscles of the loins, croup and thigh felt hard and painful on pressure. Only in one patient were there inflammatory symptoms in the fore and hind feet. Temperature 38.9° C. to 39.4° C.; pulse from 42 to 50; respirations 20 to 28; appetite poor or absent. From these symptoms and with the history that the horses had stood overnight in high damp grass the diagnosis of muscular rheumatism was given. The horses were probably brought to the spot in a heated condition, rapidly cooled in the damp misty night, and stood for hours together in the damp grass, which in places reached up to the belly and chest wall. Forage was taken with the horses and consisted chiefly of oats with little hay, a circumstance which perhaps contributed to the illness, if one bears in mind the lack of movement and the long standing. It was noticeable that in the horses of the warm-blooded type of other portions of the troop which experienced the same unfavourable conditions no cases of illness occurred, whilst in the horses of cold-blooded race 50 per cent. were ill, a proof of the small capability of resistance and easy susceptibility of the cold bloods.

Treatment consisted in rest, friction, after previous rubbing with spirit of camphor and oil of turpentine, of each equal parts, warm clothing and diet. After six to ten days all the subjects recovered.—*Zeitschrift für Veterinärkunde.*

Canine Clinical.

SOMEWHAT UNUSUAL EFFECT OF MORPHIA IN TWO PUGS.

By S. J. MOTTON, M.R.C.V.S.

Penzance.

As a general anæsthetic in dogs, morphia has earned a well-deserved popularity. Apparently much larger than the doses ordinarily employed for producing general anæsthesia may be injected without fatal result.

Occasionally, however, it happens that symptoms, calculated to cause alarm when seen for the first time, may occur even when ordinary doses are employed.

I think the following two cases will support that suggestion.

Case 1.—A pug, male, aged 13, developed in the region of the anus an unsightly tumour. It was resolved to remove this, and, as an anæsthetic, twenty minims of *injectio morphinæ hypodermica* B.P. were injected subcutaneously. Vomition did not follow, but in about fifteen minutes the dog became hysterical, and yelped for nearly twelve hours continuously. During this period he became alarmingly tympanitic, and there were several liquid motions of the bowel, accompanied occasionally by the passage of flatus. He did not, of course, become sufficiently narcotized to allow of the removal of the tumour, which was excised at a later date, a local anæsthetic being used. There was a total loss of power in the hind limbs for six or seven hours. Thirteen hours elapsed before he could walk well, and before all traces of tympany had disappeared.

Case 2.—A pug, aged 2, required the removal of his eyeball. Twenty minims of *injectio morphinæ hypodermica* B.P. were again employed. Satisfactory anæsthesia did not ensue, and the dog was hysterical for eight or nine hours—yelping pitifully during the greater part of that time.

The unusual behaviour of these animals was not due to the quality of the injection, for afterwards some of the liquid from the same bottle was employed in other dogs, and the usual train of symptoms followed.

Abstracts and Reports.

VICTORIA VETERINARY BENEVOLENT FUND.

THE quarterly meeting of the Council of this Fund was held at 10, Red Lion Square, London, on Thursday, July 3, 1913. There were present: Messrs. Dunstan, Slocock, Sumner, Garnett, and Shipley.

The minutes of the previous meeting were read and confirmed.

On the proposition of Mr. S. Wharam, seconded by Mr. Abson, Mr. R. C. Trigger, J.P., was unanimously elected President for the ensuing year.

Messrs. Freeman Barrett, P. J. Simpson, E. A. West, and W. Burt were elected Vice-Presidents.

Proposed by Mr. Abson, and seconded by Mr. Garnett, Mr. Shipley was re-elected Secretary and Treasurer.

The Secretary then gave his quarterly report, arising out of which Mr. Garnett proposed, and Mr. Slocock seconded, that the donation from Mr. Simpson be left on deposit at present with a view to attempt to carry out his wishes.

The Secretary pointed out that a sum of £90 would be required to get a child into a charitable institution with a view to education.

Mr. Simpson gave a further cheque of £3 4s. 5d., donations received since the remittance of the last cheque.

On the proposal of Mr. Abson, seconded by Mr. Garnett, a hearty vote of thanks was given to Mr. Simpson for his gift, and the Secretary was instructed to write expressing the Council's gratitude.

Proposed by Mr. Sumner, and seconded by Mr. Burt, a sum of £2 be sent to the Secretary of the Home in Edinburgh towards the cost of the funeral expenses of Mrs. Johns, an old recipient.

The Council confirmed the action of the Finance Committee in making grants to Mrs. Shivas and Mrs. Walsh. A weekly grant of 5s. each was voted to Mrs. Shivas and Mrs. Walsh, on the proposition of Mr. Burt, and seconded by Mr. Wharam, the finances of the Fund being insufficient to make a larger allowance.

In presenting his report the Secretary said:—

I think, first of all, I should call to your notice the handsome donation of a cheque, value £70, received from Mr. P. J. Simpson, of Maidenhead, the result of his efforts in producing a play for the benefit of our Fund.

Financial Statement.—We have expended in the half-year to June 30, £179 7s. 4d. Our income has been £257 17s. 5d. We have, therefore, a balance of £81 2s. 1d. Outstanding subscriptions, £60 15s. Dividends, £48 3s. 9d.; making a total, if all outstanding subscriptions are paid, of £190 os. 10d. to meet a liability of £174 for relief.

If any fresh cases occur this will leave practically no money to help and no money for incidental working expenses.

We have now thirty-two members of the Council. If I could only induce them to find two subscribers each to our Fund, how much better off we should be.

We also owe a great debt of gratitude to the Veterinary Press for the help they have given us, and I especially appreciate very much their kind remarks.

THE LATE MR. R. A. N. POWYS.

It is with very great regret that we announce the death of Mr. R. A. N. Powys, which occurred suddenly from heart disease on July 10.

For nearly forty years Mr. Powys held the position of Secretary to the London Veterinary College, and during that



THE LATE MR. R. A. NORMAN POWYS.

For Thirty-seven Years Secretary of the Royal Veterinary College, Camden Town.

time literally hundreds of students and their parents came before him, mostly during the awe-striking period of a first interview with their *Alma Mater*; and his bold, clear handwriting was generally the first which ever started them on their future careers

as veterinary practitioners. To the student he was always courteous, and to those who knew him intimately, his colleagues in daily life at the College, he was warm-hearted and a real good friend. That he should have reached his 70th year seems almost incredible, and his unvarying regularity in his work made him looked upon as a pillar of the College which could never be removed or done without. So rarely was he late at arriving or departing from the College precincts that the students almost set their watches by his presence; and by his death, practically in harness, the veterinary profession has lost one more of the landmarks of its career.

ROYAL COLLEGE OF VETERINARY SURGEONS.

At the meeting of the Board of Examiners, held in London on July 7 for the Written, and on subsequent dates for the Oral and Practical Examinations, the following gentlemen passed their respective Examinations:—

ROYAL VETERINARY COLLEGE, LONDON.

Final Examination.

Mr. W. A. Austin	Mr. V. J. Hare
„ C. E. W. Bryan	„ H. Hicks
„ J. Blackburn	„ W. Kendrick
„ R. T. Davis,	„ A. V. Nicholas
„ C. Davenport	„ A. A. Pryer
„ H. W. Dawes*	„ J. M. L. Penhale
„ G. van de W. de Kock	„ J. Southall
„ R. Daubney*	„ W. L. Sheffield
„ G. O. R. Grey	„ A. R. Smythe
„ D. C. Greene	„ G. M. Vincent
„ A. Hoskin	„ J. A. Ward

Third Examination.

Mr. C. O. A. Anderton	Mr. G. H. Melck*
„ R. M. Bamford	„ W. B. Pershouse
„ S. R. Beaumont*	„ R. J. Stow
„ H. H. Curson*	„ R. H. Stalker
„ H. S. Cockburn	„ F. H. Stainton,
„ E. E. Jelbart	„ J. F. D. Tutt*
„ R. H. C. Lucas	„ C. H. S. Townsend
„ A. G. E. Lalor	„ W. H. Wortley*

Second Examination.

Mr. F. J. Andrews	Mr. H. C. Rockett
„ T. J. Bosworth	„ W. Shipley
„ F. Canilla	„ P. R. Turner
„ H. V. M. Métivier*	„ T. L. Wright*
„ W. R. McKinna*	„ G. S. Walker
„ G. E. Oxspring*	„ E. Wallace
„ R. H. Penhale*	„ J. H. M. White

Marked thus (*) passed with Second-class Honours.

First Examination.

Mr. G. Barnett*	Mr. L. Hughes
„ S. C. J. Bennett*	„ C. W. Heane*
„ J. C. Coleman	„ F. L. Haydon*
„ C. K. Calder	„ R. B. Nelder
„ R. Catmur*	„ L. E. Pritchard†
„ A. Carter*	„ C. J. Peach*
„ I. R. R. Coleman	„ S. R. Rippon*
„ W. H. Dickinson*	„ G. C. Taylor
„ H. J. Edwards	„ G. F. Watkins

ROYAL VETERINARY COLLEGE, EDINBURGH.

Final Examination.

Mr. J. Conner	Mr. R. S. Little
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Third Examination.

Mr. N. Brear*	Mr. D. Marshall*
„ T. Dalling	„ T. M. Mitchell
„ J. W. Hayes	„ J. J. Plunkett
„ G. C. Lancaster	„ R. Simpson
„ R. G. I. Lake	„ B. van der Vijver

Second Examination.

Mr. W. H. Dennett	Mr. W. Hay
„ R. Dalling	„ C. K. Lomas*
„ J. Edgar*	„ B. Philp
„ W. Harley	„ R. K. Porteous

First Examination.

Mr. T. Bannatyne	Mr. J. Judge
„ A. Noel Metcalfe	„ E. H. Milner
„ N. Bisset	„ E. C. Nelson
„ J. D. Coutts	„ J. R. Rider*
„ J. S. Carewal	„ A. Rouse
„ G. Howie*	„ C. V. Watkins
„ J. Knox Irvine	

ROYAL VETERINARY COLLEGE OF IRELAND.

Final Examination.

Mr. J. J. O'Neill	Mr. J. J. Mills
„ T. G. Browne	„ J. J. Pomeroy
„ M. P. Hatch	„ T. Kerry Reddin
„ J. J. Hegarty	„ C. M. Stewart
„ J. P. McNally	„ Ml. Twomey

Marked thus (†) passed with First-class Honours.

Marked thus (*) passed with Second-class Honours.

Third Examination.

Mr. J. Campbell	Mr. P. J. Haves
„ S. O'Donel	„ H. Jewell
„ E. H. Wyly	„ M. J. Killelea
„ W. A. Buchanan	„ R. J. Lowe
„ W. G. Clarke	„ P. J. Mulcair
„ F. J. Daly	„ O. D. Neary
„ H. Dolan	„ J. O'Carroll
„ C. P. Fisher	„ W. P. Power
„ S. Flood	„ M. J. Ryan

Second Examination.

Mr. J. J. English	Mr. W. H. Heaney
„ T. J. McDonald*	„ J. J. Mullaney†
„ J. A. Brew*	„ T. F. O'Connor
„ J. M. Culhane	„ M. A. Sexton
„ T. A. M. Finch	„ T. F. Tunney†
„ J. J. Fitzsimons	„ M. A. Murphy

First Examination.

Mr. J. J. Clune	Mr. W. Forde
„ P. J. Cooney	„ E. V. Kelly*
„ H. C. Evans	„ J. Malone
„ T. C. Hall	„ R. S. W. Peatt
„ J. J. M. Barry	„ J. A. Power
„ J. Bell	„ W. Reidy*
„ J. Brosnan*	„ W. J. M. Rouse*
„ J. J. Condon	„ C. B. Ryan
„ F. H. Doyle	„ W. L. Sinton
„ M. Farrelly	„ D. P. White

GLASGOW VETERINARY COLLEGE (INCORPORATED).

Final Examination.

Mr. J. Scott Moncrieff	Mr. T. T. Taylor
„ R. McKay Lawson	

Third Examination.

Mr. E. E. McLachlan	Mr. W. Watt
„ J. D. Fulton	

Second Examination.

Mr. A. Campbell	Mr. J. Robertson
„ N. A. McEwan	„ W. Macgregor

First Examination.

Mr. J. S. Keane	Mr. F. McKenzie
„ A. Robertson	„ D. Gillmor
„ D. E. Orr	„ W. R. Smith
„ J. M. Gray	

Marked thus (†) passed with First-class Honours.

Marked thus (*) passed with Second-class Honours.

Review.

A System of Veterinary Medicine. By various writers. Edited by E. Wallis Hoare, F.R.C.V.S. Vol. I, "Microbial Diseases." London: Messrs. Baillière, Tindall and Cox, pp. 1,328 + xvi. Royal 8vo. Price 21s. net.

In the May number of *THE VETERINARY JOURNAL* we gave what was necessarily a preliminary and brief notice of a new text-book on veterinary medicine, which has now removed from the English veterinary profession a reproach which has been present for years, and has brought it into line with Continental veterinary science; and for this, even if there was no other reason, Mr. Wallis Hoare deserves the thanks of his English colleagues. The labour bestowed upon such a work is colossal, and Mr. Hoare has done wisely in inviting the collaboration of specialists upon subjects other than those in which he himself can claim exceptional experience, for the range of animal diseases is so vast, and the knowledge upon the subject has increased so much during recent years, that for any one man to attempt to be a specialist upon them all would be an absurdity. Even the editorship of such a subject as that comprised under the title of "A System of Veterinary Medicine" gives work such as no one who has not attempted anything of the kind can ever dream of, and to have produced a book which brings the subject up to date, Mr. Hoare, who is a busy practitioner, must have sacrificed many years of leisure. It is the busy man who finds time to do other work, and the editor of this book is a proof of the adage. The book is intended for the daily practitioner, and the whole tone of the writing throughout marks it for this object—the collaborators selected being men who have had special experience in the disease or diseases upon which they write.

In the first volume the microbial diseases are classified and dealt with, and their list is a lengthy one, far too lengthy to deal with in detail in the space allotted for a review; and some idea of things may be obtained from the fact that their description runs into a total of some 1,328 pages. Suffice it to say that as a work of reference the book is one which every practitioner should possess—especially those who hold positions as inspectors under the Board of Agriculture or the various County Councils.

The printing and binding of the book is the best possible, and a tribute to the publishers. In fact, for everything, external appearance and internal knowledge, it is the best guinea's worth the profession has had put before it in the whole of its history.

Translation.

VERGOTININE IN THE TREATMENT OF BROKEN WIND (PULMONARY EMPHYSEMA).

By H. PERRIN.

Officer of the Legion of Honour; formerly Chief Veterinary Surgeon of the French Army.

In these days of strenuous competition it is extremely important that the utility of those animals which share man's labours should be uninterrupted by disease, or, if such a misfortune should occur, it is of the greatest importance that they should be cured as quickly and as completely as possible, so that they may be able to return to work without avoidable delay.

Among the diseases to which horses are subject the one known colloquially as "broken wind" occurs pretty frequently as a sequel to affections of the respiratory organs, especially after bronchitis, after bronchial catarrh in young animals, and after various other chest complaints in animals of all ages.

Broken wind supervenes when the bronchial tubes are clogged with catarrhal phlegm, the smaller bronchioles being stopped up, and the pulmonary vesicles being more or less filled with the products of inflammation or of muco-purulence; violent fits of coughing are caused and consequent dilatation of the vesicles is produced and they are frequently ruptured. It follows then that air escapes from the said vesicles and penetrates into the pulmonary lobes, where hæmatisation ensues and certain formations, like little pockets, are initiated; these end by compressing neighbouring vesicles. The resultant suppression of such vesicles limits the area of respiration, and breathlessness is the only effect of hastened breathing.

Pulmonary emphysema is also due to violent straining in drawing heavy loads; the lungs being filled to excess in order to enlarge the thoracic cavity and thus to afford increased power of resistance to the muscular traction that is demanded by a supreme effort. Dilatation sometimes results, and sometimes actual rupture of the vesicles ensues on account of the fixed rigidity of the thorax. The glottis of the antrum is also liable to occlusion, in which case the inspired air cannot be released through muscular action.

A similar effect can be produced by dust, especially when it is accompanied by heated air, as in summer. Obstructions are due to the action of dust on the mucous membranes or to the cough which is provoked.

It is well known how unbreathable air can become when it is loaded with the dust which is raised in such clouds by automobiles rushing along unprepared roads.

The flower dust of forage, especially of old lucerne, acts on the respiratory organs much in the same way as other dust. Sore

throats and infectious pneumonia sometimes follow feeding on powdery grasses.

Pulmonary emphysema was known formerly in France under the name of "*Haut Vent*."

In such cases as have been described, the horse-doctors of old considered the lung itself to be contused or lacerated, as they believed, through the violence of coughing; later on various authors recognized that broken wind can more reasonably be attributed to dilatation and rupture of the pulmonary vesicles with atrophy of inter-alveolar cells.

This view was corroborated by assiduous *post-mortem* examinations. These autopsies of emphysema revealed in the substance of the lungs and on the surface under the pleura the existence of rounded prominences that were filled with air and that resembled minute pockets, of the size of a pea or larger. This condition made the surface of the lungs look like the skin of batrachians.

In its beginnings pulmonary emphysema can very easily escape notice, that is to say, while its ravages are circumscribed; but by degrees the affection is bound to involve a larger area and the symptoms must eventually attract attention.

The animal begins with a little dry cough, repeated from time to time, especially at night and in warm air. Then, little by little, this cough becomes more frequent. It is observed that the animal quickly gets out of breath when at work. The expiration begins to be interrupted, for there seems to be more or less difficulty in getting rid of air that has been drawn into the lungs; then soon the same difficulty is observed with regard to inspiration, and often grey mucus is seen adhering to the wings of the nostrils, which are always very much dilated after a run or even after very moderate work. At a further stage of the complaint, when respiratory interruptions are accompanied by starts, breathing becomes noisy. The animal ends by being completely broken-winded, it pants incessantly, and is unable to do any more real work at the risk of suffocation.

The prospects of the affection are so grave that the existence of emphysema in an animal renders the purchase of it null and void. In all times the best efforts have been directed to the cure or mitigation of this complaint, but very little success attended the employment of all the numerous remedies that used to be tried.

Of recent years, however, in consequence of a more thorough knowledge of the lesions that characterize the condition, and also thanks to the many new chemical discoveries that have been utilized, the treatment of emphysema has become much more hopeful. We ourselves, in common with numerous other veterinarians, have used with the very best results a combination of veratrine, strychnine and ergotinine made up with glycerine. This has been called Vergotinine. These alkaloids act both in a general and in a special manner. The special local action principally affects the structure of the pulmonary vesicles by restoring the contractibility which had been lost through undue distension. This

local action of vergotinine is even able to renew the elasticity of vesicles that have been compressed almost out of existence by their distended neighbours, or by the encroachments of interlobular air pockets. The latter are reduced by degrees until they disappear and all vesicles gradually recover their tone. Stretched and attenuated capillaries return to their normal condition, consequently the re-establishment of regular and renovating nutrition conduces to the regeneration of ruptured vesicles and of more or less atrophied inter-alveolar cells.

In proportion to the working of vergotinine after administration, the breathing appears to be rendered easier, its rhythm becoming regular. The cough is less frequent, less violent and less resonant, finally it ceases altogether.

Besides acting locally, vergotinine effects a great improvement in the general health through its power of correcting irregularities in the functions of nutrition and also through its stimulative action on the organs of respiration, through its power of regulating deep circulation, of alleviating cardiac and pulmonary troubles, and of increasing the activity of the nerve centres.

In fact, this valuable preparation is found to be a very active agent in health restoration; it quickly gives back full strength to any suffering equine on whom it is tried. Its employment is indicated in all chest complaints, since it is desirable that they should be cured as soon as possible and that the possibility of any subsequent emphysema should be averted.

The symptom of continual running at the nose, accompanied by cough, is a special warning of the necessity for recourse to this specific. Numerous trials have established the effectiveness of vergotinine in the treatment of pulmonary emphysema and of the chest complaints which are likely to bring it on.

The *Répertoire Vétérinaire* of November 1, 1911, published accounts of excellent results that had been obtained. Another important testimony to the same effect is given by Berraud, veterinary surgeon in charge of the horses of the Parisian Suburban Cab Company. He attributes to vergotinine the improvement and cure of many broken-winded horses; some among them had been sufferers of long standing.

Vergotinine is well known, not only in France, but in other countries where it is already much used and with equal success. In Italy the Professor of Pathology and Clinical Science at the Veterinary School of Turin recognizes the preparation as a valuable therapeutic resource, that, by regulating the rhythm of respiration, in a short time it renders possible the satisfactory resumption of work by horses which had been incapacitated by advancing emphysema. This had previously prevented them from moving, except at a foot's pace, and even then they were obliged to stop every moment for want of breath.

In Germany, the *Tierärztliche Wochenschrift* (veterinary weekly), of Berlin, of October 10, 1910, gave publicity to the experiences of Schade, who was extremely successful in his treatment of chronic diseases of the lungs by means of

Vergotinine. He particularly mentions the case of an Oldenburg stallion who was suffering from chronic emphysematous dyspnoea which had formerly been treated in various ways without improvement, but which was quickly cured by vergotinine.

To all these favourable reports we add our own. We are continually employing Vergotinine, not only in the treatment of pulmonary emphysema, but in all chest complaints. To our mind the preparation is the best means of overcoming the atrophic inertia of affected organs and of re-establishing their physiological nervous activity.

We would mention, as an additional merit in Vergotinine, the ease with which it can be administered. It is made up in the form of a mixture, the dose of which is a teaspoonful, to be sprinkled over the feed, small doses only being required. If the above-mentioned mode of administration could not be adopted, it would be necessary to inject the alkaloids every day with a Pravaz syringe, and many animals would not endure the frequent repetition of such a method of treatment; besides, it would be costly, whereas the method as advocated is most economical.

Letters and Communications, &c.

Captain Williams; Mr. Motton; Mr. Mitchell; Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Captain Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Captain Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande, et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

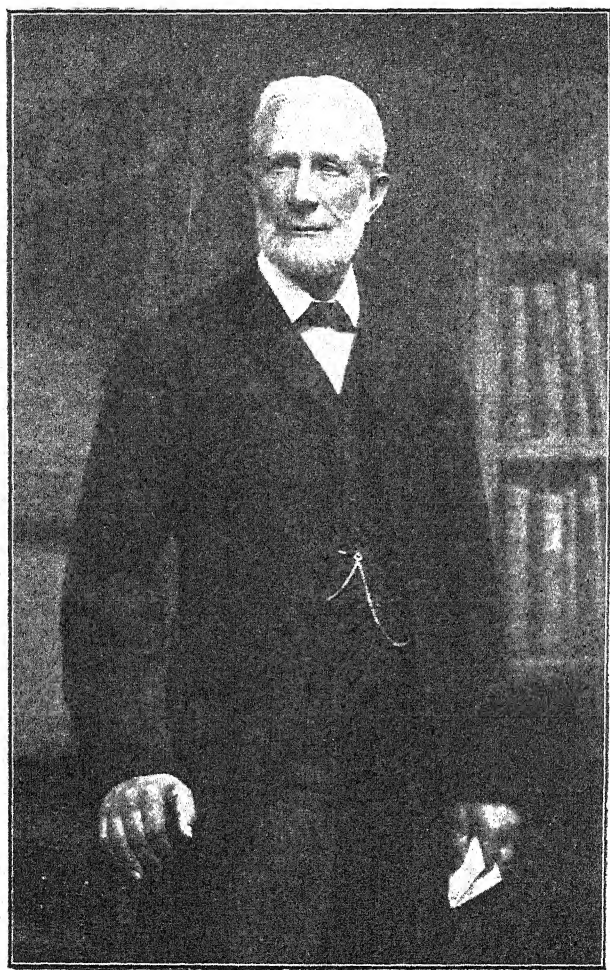
NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox



SIR RICHARD P. COOPER, BART., M.R.C.V.S.

THE VETERINARY JOURNAL

SEPTEMBER, 1913.

SIR RICHARD P. COOPER, BART., M.R.C.V.S.

WE very much regret to announce the death of Sir R. P. Cooper, Bart., of Shenstone Court, Lichfield, Staffordshire, which took place at Berkhamsted, on Wednesday, July 30.

Richard Powell Cooper was born at Aston-on-Clun, Salop, in September, 1847, and was thus in his 66th year at the time of his death. His father was a typical yeoman and in this way he was early made familiar with agricultural pursuits. He was educated privately and then proceeded to the Royal Veterinary College, Camden Town, to study for the veterinary profession, taking his diploma and becoming registered as a Member of the Royal College of Veterinary Surgeons in April, 1868. Settling down in practice soon afterwards in Lichfield he joined the Staffordshire Yeomanry, and acted as Veterinary Surgeon to his corps from 1872 to 1890. He continued to carry on his professional work, gaining the full confidence of an extensive *clientèle*, until the death of his uncle and brothers; as the result of which he became partner in (and then head of) the firm of William Cooper and Nephews, chemical manufacturers, Berkhamsted.

Sir Richard found time to take an active interest in municipal and county work and at various times was a City Councillor, an Alderman of the City Council of Lichfield, and a member of the County Council. In 1897 he was placed on the Commission of the Peace for the County of Stafford, and in 1901 held the office of High Sheriff.

It was, however, in connection with agriculture and stockbreeding that Sir Richard Cooper became best known, his success being no doubt largely due to his professional training as a veterinary surgeon. He was an active member of more than fifty agricultural and breeding societies in Great Britain and abroad, and was one of the most energetic of the members of the Royal Agricultural Society, being

a great believer in the migratory system of the Society's show. Very successful as a breeder and exhibitor, and one of the largest exporters of live stock in the kingdom, he sent abroad in 1910 over 3,000 head of pure bred stock, including cattle, sheep, and pigs. His firm has also done excellent work in investigating animal diseases, both at their research laboratory at Berkhamsted and at their experimental station in South Africa.

Sir Richard received his baronetcy in December, 1905. In politics he was an ardent Unionist and Tariff Reformer.

He married, in 1872, Elizabeth Anne, eldest daughter of Elias Ashmall, of Hamnerwick, and had two sons and three daughters, all of whom survive him. His eldest son, Mr. R. A. Cooper, M.P., succeeds to the baronetcy.

THE SOUTH AFRICAN VETERINARY CONFERENCE.

THE Conference of Veterinary Surgeons convened by His Excellency the High Commissioner to consider measures to combat rinderpest in case the outbreak should spread from German East Africa met at Bulawayo on April 10. All the British South African States and Dependencies were represented, and delegates were also sent from British East Africa, Portuguese East Africa, the Mozambique territory and the Belgian Congo. Mr. J. M. Sinclair, Chief Veterinary Surgeon of Southern Rhodesia, presided. The Conference sat for four days, during which period, in addition to rinderpest, such subjects as African Coast Fever, tuberculosis, Inter-Colonial movement of stock and importation from overseas, lung-sickness, epizootic abortion, trypanosomiasis and anthrax were discussed. Various resolutions were adopted, and these, after being sent to the High Commissioner, were submitted to the respective Governments. Every subject received careful consideration, and we feel sure that the exchange of ideas and experiences promoted by the discussions will be of considerable assistance to each delegate, and of value to the Government represented.

Editorials.

A GRATUITOUS INSULT TO THE VETERINARY PROFESSION.

It is indeed difficult for us to abstain from speaking as we should like to with reference to an unjust and wholly unnecessary affront offered to the veterinary profession at the recent International Congress of Medicine by Professor Harvey Cushing, of Harvard University. In the course of his address Professor Cushing is reported, both by the *Times* and the *Lancet*, to have said that "Though it is less true of many European countries where veterinary institutes, which are doing admirable progressive work, are under Government control in close association with universities, in the United States, and I think the same is true in a measure of Great Britain, most veterinarians have profited not at all by the advance in general medical knowledge of the past generation. This applies particularly to veterinary surgeons who still trust, in the operations which they venture to undertake, to the rough and casual methods of old, with scant, if any, pretence to the modern refinements of skilful anæsthetization and aseptic surgical technique."

We do not know on what authority Professor Cushing makes his statement, but we unhesitatingly point out to him that so far as the British Isles are concerned there is a lamentable lack of truth in his statement, and we shall be very much surprised if he is not convinced before long by American veterinary surgeons that it is equally untrue of them. In fact, it would seem to us that the only suggestion of truth in the whole statement was his reference to the State control and good work of the European veterinary institutes.

Comparisons are always odious, but we do not in any way wish to disparage the great surgical profession when we say that in Great Britain, at any rate, the veterinary general practitioner has really made far greater progress in major surgical operations than has his *confrère*, the general practitioner in human surgery. In these days, in human practice, it is an exceedingly rare occurrence for a general practitioner to perform any abdominal section or other major operation; he almost always procures the assistance of the specialist. On the other hand, the rank and file of the veterinary profession are constantly and daily performing, not merely venturing, such operations successfully in the course of their general practice.

The Professor's statement as to anæsthetization is equally untrue. It is extremely rare for any painful operation (castration alone excluded) to be performed nowadays by veterinary surgeons without the assistance of an anæsthetic, either local or general. In fact, we may with pardonable pride point out that it has been repeatedly publicly acknowledged that it is owing to the pioneer work of a veterinary surgeon that the present vapour method of chloroform inhalation (both for human beings and animals) has attained its present state of perfection. Also that at the International Medical Congress itself, had Professor Cushing only taken the trouble to find out, there was demonstrated in the Anæsthetic Section an apparatus designed for the exact percentage administration of chloroform and other anæsthetic vapours by the aid of electricity, the author of it (a veterinary surgeon) receiving every possible encouragement and approval.

It is necessary also to point out the great disabilities under which we labour in comparison with the human surgeon. Our clients absolutely decline in the vast majority of instances to pay for a second professional man to administer the anæsthetic, so that, as a rule, the veterinary surgeon has to administer and look after the anæsthetic as well as to perform the operation; and he does so with a truly remarkable degree of success. We wonder how even Professor Cushing himself would get on under such conditions.

Then as to *aseptic* methods of surgery, if Professor Cushing used the word *aseptic* intentionally as distinguishing it from *antiseptic* methods, he at once exposed his utter ignorance of the conditions of control of veterinary patients. It is not possible for us to place our patients in nice boiled sheets after an operation, and they will not heed our injunctions that they must not disturb the dressings. If, however, he intended to include antiseptic methods then his statement is equally indicative of his ignorance of the progress of veterinary surgery. Our excellent results are only obtained by strict attention to Lister's precepts.

We make no excuse for taking Professor Cushing to task over these matters, and we would point out the fact that, although he is an eminent man in his own profession, he is in no wise excused from wantonly going out of his way to impugn the professional ardour of the younger sister profession of whose doings he is by his own showing absolutely ignorant. Moreover, as his mis-statement has received wide publication, it is equally necessary to take full steps to

refute it, in this country at any rate. So far as the United States are concerned we can well leave the gentleman to be dealt with by those eminent veterinarians, Liautard, Williams, Merrillat, Hughes, Adams, and others; and we should advise him to be more certain of his facts in future before indulging in foolish and libellous statements.

General Articles.

ACCESSORY RENAL ARTERIES IN TWO PONIES.

By W. M. MITCHELL, M.R.C.V.S.

Anatomy Department, Royal (Dick) Veterinary College, Edinburgh.

VARIATIONS in the blood supply to the kidneys in the horse are of not infrequent occurrence, but the two following and somewhat similar deviations seem worthy of note from a developmental point of view.

The variations, which can best be followed by examination of the accompanying figures, were observed in two ponies which, strange to relate, were in process of dissection at the same time. It will be noticed in both cases that arising from the external iliac artery, in one case on the right side only, but in the other on both sides, are accessory renal arteries which run directly forward to the caudal extremity of the kidney of its respective side, and there disappear to apparently supply that part of the organ.

As is well known, the kidney arises in the embryo as a tubular diverticulum from the Wolffian duct close to its entrance into the cloaca, and this diverticulum grows forward, becoming gradually more highly developed until the permanent position is reached in the sub-lumbar region. Up till this time the function of the kidney is carried on by the mesonephros, or Wolffian body, a large glandular mass situated at the side of the vertebral column extending practically the whole length of the abdominal cavity, and highly vascularized by numerous vessels springing directly from the abdominal aorta.

It has been shown by Hill* in the case of the pig that the kidney possesses no apparent blood supply until it reaches its permanent position, when an artery arises from the aorta and

* Hill, E. C.: "On the First Appearance of the Renal Artery, and the Relative Development of the Kidneys and Wolffian Bodies in Pig Embryos." *Johns Hopkins Hospital Bulletin*, 1905, No. 167, p. 60.

grows into the kidney substance. As soon as the glomeruli of the kidney become vascularized the mesonephros begins to atrophy. This atrophy commences at the cranial end, and gradually extends backwards, the atrophy of the glandular tissue

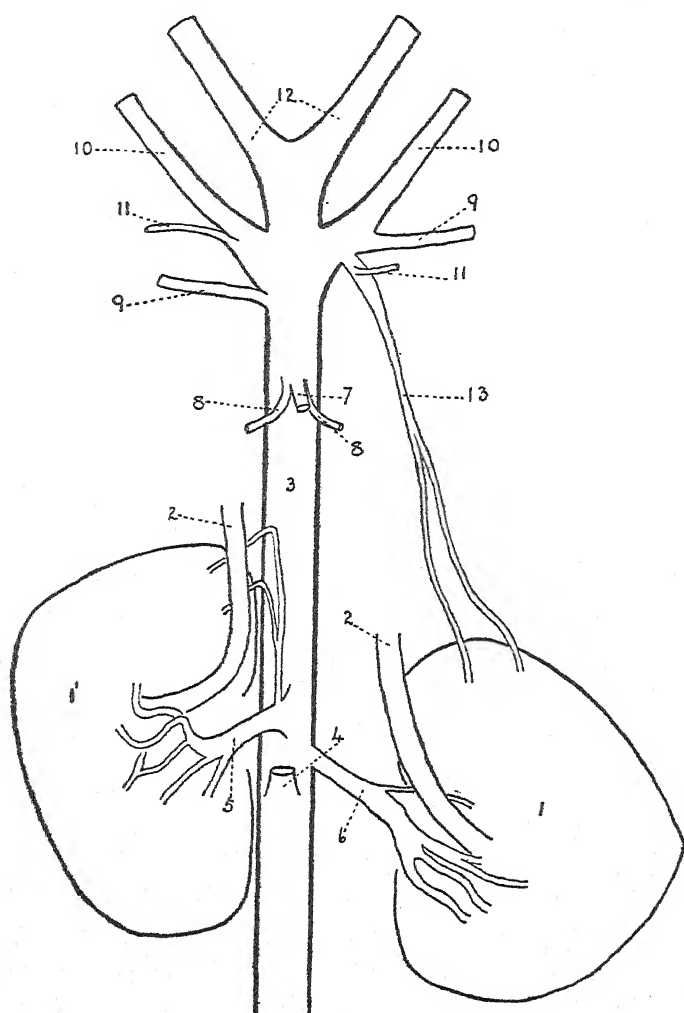


FIG. 1.

being accompanied by a corresponding dwindling of the more cranial vessels springing from the aorta.

Hill has further shown that in the pig the posterior part of the mesonephros becomes firmly attached to the kidney a little time before the complete disappearance of the caudal arteries.

In the light of what Hill has found in the pig, it seems reasonable to look upon the accessory renal arteries found in the two ponies the subject of this paper as persisting caudal arteries which at one time supplied part of the mesonephros.

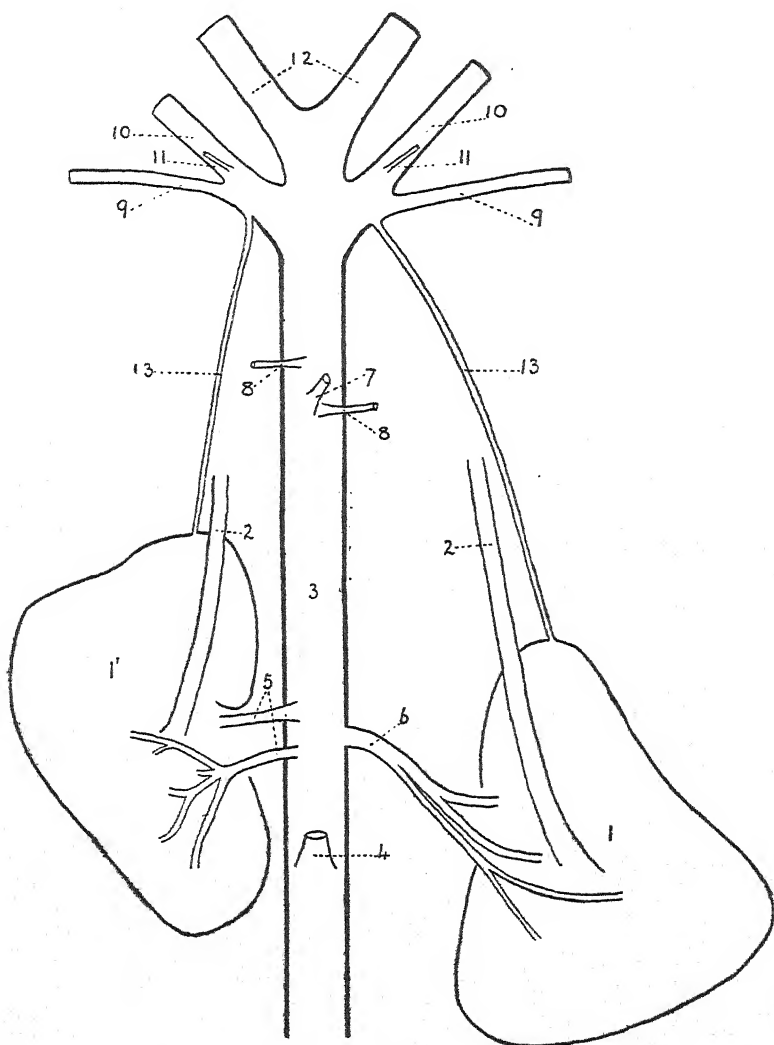


FIG. 2.

1, Right kidney; 1', left kidney; 2, ureter; 3, abdominal aorta; 4, cranial mesenteric artery; 5, left renal artery; 6, right renal artery; 7, caudal mesenteric artery; 8, internal spermatic artery, in fig. 1, ovarian artery, in fig. 2; 9, deep circumflex iliac artery; 10, external iliac artery; 11, external spermatic artery, in fig. 1, uterine artery, in fig. 2; 12, hypogastric arteries; 13, accessory renal artery.

THE STATUS OF THE QUALIFIED VETERINARY SURGEON IN NEW SOUTH WALES.

By T. G. PALGRAVE, M.R.C.V.S.

Auckland, New Zealand.

"Then fancy while thou art—thou art but what
Thou shalt be—nothing—thou shalt not be less."

OMAR KHAYYÂM.

THE qualified veterinary surgeon has no legal standing in New South Wales as he is not protected by law, there being no "Veterinary Surgeons Act" in that State.

Any person has the right to style himself veterinary surgeon and to practise as such, independent of whether he possesses any veterinary knowledge or not. As an example I may quote the case of a *soi disant* veterinary surgeon who practised in one of the large country towns. This practitioner (save the mark!) once invited me to view a case of fracture of the "tibbutt" bone; on another occasion he informed me that he had cured several cases of tetanus by injecting *aeroplanes*; and on yet another occasion he told me that he had been called to a town over 100 miles away from his residence in order to remove three ribs from a horse, that the operation was entirely successful, and the horse was back at work and had won a big race—due to his being relieved of the weight of the three ribs, I presume.

In the neighbouring State of Victoria the qualified practitioner has a vastly better standing, as owing to the "Veterinary Surgeons Act" in force in that State, he has a recognized position in the general scheme of things, and his professional and social status is improved thereby. There are certain degrees in veterinary science which are publicly recognized as guarantees that the holders have undergone a set course of training and have successfully passed the required examinations; they are the hall-marks of the veterinary practitioner, "without which none are genuine." Certainly there are *quasi* degrees of sorts to be found on signboards in various parts of New South Wales, and how weird and wonderful are they. I might mention the following: "M.M.C.V.S."; "F.M.I.V.S."; "highly qualified veterinary surgeon"; "duly and fully qualified veterinary surgeon"; whilst "professors" are abundant. In short, the variety of degrees is only approached by the numerous ways of spelling the words "veterinary surgeon." Apostles of Esperanto and of phonetic

spelling must have been often in evidence when these signs were painted.

The advancement of the profession in Victoria has been largely due to the efforts of S. S. Cameron, Director of Agriculture ; J. A. Gilruth, lately Principal of the Veterinary School of Melbourne University, whose good work will doubtless be ably continued by H. A. Woodruff ; and W. T. Kendall, the pioneer of veterinary teaching in Victoria.

Had New South Wales possessed such men there would have been no need for members of the profession in that State to say, in the words of one of the characters in "Erminie," "how different things would be if they wasn't as they is."

Another factor which militates against the advancement of the profession in New South Wales is the subordinate position occupied by the veterinary surgeon in State employ. In Victoria the highest and most responsible position in the Department of Agriculture can be held by a veterinary surgeon ; each member of the profession in the employ of the State carries a figurative "marshal's baton in his knapsack," and has a due proportion of authority vested in him. He is trusted to use his own initiative in carrying out his duties, and is not a mere automaton. In New South Wales the State employed veterinary surgeon is looked on as one of "*οι πολλοι*"; is subordinated to laymen—to office clerks in some cases—and occupies the position of the soldiers referred to by the centurion of the Scriptures ; he has not as much administrative power as a stock inspector, and while he may "advise" he must not presume to "instruct" that officer. The highest post open to him so far is that of Chief Inspector of Stock in the Department of Agriculture, or Chief Veterinary Inspector in the Department of Public Health, both being subordinate positions. As a certain ex-Minister for Agriculture remarked that "he could bring an old country blacksmith who could run rings round any veterinary surgeon who ever came out of a college," it is perhaps not surprising that the status of the veterinary surgeon in Government employ is lowly.

Much might be done by the passing of a properly drawn "Veterinary Surgeons Act," and again much might be done if a veterinary surgeon of marked ability and strength of character came to the front in the State service. Perhaps in the fulness of time one such will make the opportunity. *Quien sabe?*

EPIZOOTIC LYMPHANGITIS AND ITS TREATMENT.

By A. F. HARBER, M.R.C.V.S.

Government Veterinary Surgeon, Durban, South Africa.

IN this article I shall only briefly describe the cause, nature, and symptoms of the disease—for a detailed account I would refer the reader to the work by Pallin, where it is well described—my principal object being to bring to the notice of the profession the results I have obtained in its treatment, both preventive and curative.

The disease has been known in countries in the East, such as India, China, Japan, for a considerable time, and it is prevalent also in other countries, such as the Philippines, Mauritius, Northern Africa, and parts of Europe. A few years ago it was introduced into the British Isles from Natal, but was successfully dealt with by stamping out. I think, however, that the conditions there are not so favourable to its spread and development as in other countries.

The disease is one affecting the lymphatic system of the skin and subcutis, producing usually well-marked symptoms or lesions in the form of pustules (buds), sores or ulcers, or both, along the course of the lymphatic vessels, which in most cases are more or less thickened or "corded," due to the invasion of those parts of the organism by a cryptococcus.

Any part of the integument may become affected, but there are certain parts more liable, or perhaps more commonly affected than others. These are in the great majority of cases the limbs, on the inner parts of the thigh and arm, the reason being no doubt due to the fact that the legs are more liable to wounds from a variety of causes, such as kicks, pricks from thorns, and other injuries.

Although the lesions are met with most often in the thigh or arm, I think that the infection has gained entrance lower down the leg below the knee or hock, and is carried along the lymphatic vessels, which in this situation are smaller and probably not so well supplied with glands, until it reaches a point higher up, where it becomes arrested and there propagates. I have not seen a definite cording of the lymphatics (except in one instance) below the knee or hock, although there may be one or two small buds or ulcers; thickness of the skin here no doubt prevents the smaller vessels from showing up.

The thickened or corded condition of the lymphatic vessels and glands is an inflammatory one produced by the presence of the organism. The swollen gland is the pustule or bud which usually bursts, discharging a yellowish pus rich in organisms. In some cases the lesions are associated with a good deal of inflammatory swelling or oedema to the thickness of an inch, with the edges well defined as in a case of purpura.

The infective nature of the disease is well known to those acquainted with it, but the infection spreads comparatively slowly, and is more or less localized except in a few instances where the disease appears to spread rapidly. A number of buds with intervening corded lymphatics may appear in such cases almost simultaneously, showing that the infection has passed rapidly through the vessels until it was arrested in a group of glands. I have seen cases where the owner stated that the lesions, which were well marked and fairly numerous, had appeared in forty-eight hours. In an outbreak among 120 transport mules, which were inspected daily, lesions in some appeared in twenty-four hours (unbroken buds), and upon careful examination no wound could be detected by which the organism could have entered; in these cases the infection was not carried by harness, as the animals were in strict quarantine and not being worked.

The infection if not checked will spread until it affects almost the whole of the lymphatic system of the skin and underlying parts, and would in all probability produce death from exhaustion or "toxæmia," or both, if the disease were left to run its course. It is stated that the disease sometimes becomes generalized with lesions in the internal organs, but personally I have not met with it. From my experience the disease spreads more rapidly in the donkey than in other equines.

Once the infection has obtained a foothold in a stable or other premises it has been a difficult matter to destroy it. I think it probable that the organism is to be found almost anywhere in the soil in some localities under certain conditions, similar to the organism of tetanus; this point, however, requires further observation, and, if correct, will explain the origin of many cases where the source of infection is obscure.

It is, of course, conceivable that localities where the disease has previously existed will be a more fruitful source of infection.

The infection in this country (Natal) has confined itself principally to the coastal districts; probably the conditions there

favour its growth, &c., though it has occurred farther inland as well at much higher altitudes, but in these places the method in vogue of dealing with the disease, *i.e.*, stamping out and quarantine, was much more successful.

All possible precautions have been taken to prevent the spread of infection when a case occurred on a property, particularly if there were any in-contact animals, and in some places there are many such, as on some of the sugar estates, where large numbers of equines, chiefly mules and donkeys, are kept.

The procedure briefly is as follows:—

The infected animal is destroyed and the carcase suitably disposed of. All in-contact material is disinfected or destroyed, harness is immersed in a solution of some disinfectant for twenty-four hours, shafts, poles, swingle-bars are repainted, trek chains are put into a fire for a time, and even the attendants' hands are disinfected. The stable is properly treated or destroyed, but with all these precautions the disease continues to spread.

It appeared to me that there must be some more potent factor conveying the disease, at least in the majority of cases, than any of the objects enumerated, as I have only seen a very few lesions which could be put down as having been directly caused through in-contact material. There is no doubt, however, that infected harness would convey infection should it come in contact with a wound.

I have seen many cases of infection of the brachial and prepectoral glands which at first sight appeared to have become infected from the collar or breast harness, but on examination these were in every case an extension of the disease from below.

I have come to the conclusion that the factor mainly responsible for the spread of infection is "flies." It is well known how flies will discover a wound, however small, and as many species (among them the ordinary stable-fly) are blood-sucking they make wounds themselves, and it only requires a drop of blood to attract more; the wound is thus enlarged and suppuration invariably follows. This condition is frequently seen at the back of the knees, where the constant movement prevents or retards healing.

With the object of preventing the attack of flies on wounds I use a mixture of Stockholm tar and oil. Tar is cheap, a good antiseptic, can be obtained at almost any house in the country, and I know of nothing better to keep away flies.

In areas under quarantine this treatment of all wounds, no matter the size or how caused, is carried out as one of the conditions of the quarantine notice (any condition thought desirable can be imposed under the Stock Diseases Act), and all owners of equines where possible, more particularly those in the vicinity of the outbreak, are advised to use it. With this preventive treatment the results have been very satisfactory, as the following fact will show: In twelve months the number of areas in quarantine have been reduced from forty to four. I may state that restrictions are imposed until at least six months have elapsed since the last case.

Previously in these areas an occasional case or more would appear at longer or shorter intervals, thus extending the quarantine. For example, one owner had been under restriction for three years and another nearly two years, with the loss of thirty-three and twenty-seven animals (destroyed) respectively, the cases occurring at intervals of from two to eight weeks. No more cases have taken place at either of these places since the preventive measures have been carried out.

I mention these facts to show that if flies are kept away from wounds the chances of infection are at least brought to a minimum.

Treatment.—Epizootic lymphangitis is usually described as being a practically incurable disease, in that no method hitherto adopted has given satisfactory results, and that treatment should only be undertaken in selected cases and under special conditions. Recoveries have, however, been brought about by treatment with various caustic agents, more or less violent, also surgically by the total extirpation of the affected parts, that is the lymphatic vessels, glands, and the skin covering them. This latter method (in fact both, if a violent caustic is used) is unsatisfactory, for the reason that the resulting wound is severe, takes a long time to heal, and is in constant danger of reinfection. Moreover, such treatment cannot be applied if the area involved is of any size or in the near vicinity of any important structure.

My object was to obtain a treatment that was effective and as simple as possible, and the results obtained, as shown in the accompanying table, are, I think, most promising, and would indicate that the disease is not so resistant to treatment as it appeared. Although the number is not large, the results are those of the treatment of fifteen consecutive cases.

The buds are opened, preferably with a cross incision to well expose the interior, and the cavity thoroughly curetted to remove as much as possible of the infection with the instrument. All discharge and *débris* should be put into a strong solution of disinfectant, which can afterwards be disposed of. The exposed surface is then filled with crystals of permanganate of potash, each bud being treated similarly. The ulcers as a rule have no cavity, and require only to be well scraped with the scalpel and the crystals applied. If the lymphatic vessels are much thickened, and this is sometimes irregular, they are opened at the thickest part and treated in a like manner, but unless they appear to contain pus it does not seem necessary to interfere with them, as they usually disappear. Some cases, however, require more frequent inspection than others, and any fresh buds that appear are treated as required.

It is not advisable to wait until the bud comes to a head before treating, as this only delays matters. If a nodule is detected in the process of formation, it should be cut down upon and treated or removed, as it lessens the amount of infection to be dealt with.

In those cases where the lesions are accompanied by an inflammatory œdema, a little arsenic, iodine, and resin is given, as I think it helps to disperse the swelling, though in simple cases this is unnecessary.

There is sometimes a good deal of hæmorrhage from the part operated upon, but I have found the permanganate to act as an excellent styptic. The parts around the wounds are then dressed with the tar and oil in the proportion of one of tar to four or five of oil. Castor oil is best, as it adheres better, and thus only requires renewing every two or three days. If used in stronger proportions the tar will excoriate the skin and remove the hair. The subject is isolated, and any later treatment that may be necessary is carried out as before, though in most cases nothing more is required, and the wound heals in from two to eight weeks.

It is hardly necessary to add that if a number of places have to be treated the subject should be cast and well secured. There does not appear to be any recurrence of infection after the wounds have all properly healed, as the first case treated by the writer was twelve months ago, and to-day the animal is healthy and regularly working.

The permanganate stains the hands a good deal, but this can

TABLE GIVING DETAILS OF THE CASES OF EPIZOOTIC LYMPHANGITIS TREATED BY THE WRITER AND REFERRED TO IN THE ARTICLE.

No.	Subject and lesions	Date treated	Result	Remarks
1	Donkey stallion. Buds and ulcers on prepuce, abdomen and inside thighs	Sept. 11, 1912	Cured ...	A simple case.
2	Four cases among a span of donkeys. Lesions on both fore and hind legs (thighs and arms), also on abdomen and chest	Oct. 10, "	" (4)...	Two of these cases were somewhat severe, with much thickened lymphatics.
3	Horse. Numerous lesions (advanced) covering the whole of one forearm and extending through the axilla into the brachial and prescapular glands, which was the size of a coco-nut	Nov. 20, "	Destroyed	A severe case which in a few days (4) was rapidly spreading in the other limb,
4	Horse. Lesions on side of chest and abdomen associated with much inflammatory swelling	Jan. 18, 1913	Cured ...	Severe case, swelling extending from brisket to near sheath. Treated a second time. Lesions all healed, but subject died of horse-sickness.
5	Horse. Lesions extending from the near eye over the masseter muscle into the submaxillary space involving the gland, thence down the jugular furrow to near the shoulder. Cording of the lymphatic vessels was well marked down the furrow	Jan. 12, "	"	Not severe except over the masseter muscle, where the lesions were diffuse.
6	Horse. Buds and ulcers with corded lymphatics and associated with inflammatory swelling on the near ribs	April 18, "	"	A severe case treated twice.
7	Mule. One lesion, an ulcer on near side	May 9, "	"	Simple case. Subject died later of horse-sickness.
8	Mule. Bud and ulcers on chest and ribs extending down one foreleg and posteriorly over the abdomen to near the mammary gland	" "	"	A severe case with much lymphatic swelling, wounds all healed, but subject later died of horse-sickness.
9	Horse. Unbroken buds on both forearms extending through the axillae and over the shoulder-joints, with a few lesions on the ribs of one side	" "	"	A severe case, 25 places treated.
10	Donkey. Buds and ulcers inside one thigh...	May 20, "	"	A simple case.
11	Donkey. Lesions inside one arm and thigh with corded lymphatics	May 28, "	"	Not severe, but secondary lesions were treated again on June 16, 1913.
12	Donkey. Buds and ulcers with corded lymphatics extending from the hock to the groin, also inside one arm through the axilla and over the shoulder-joint	June 16, "	"	A severe case associated with much cording of the lymphatic vessels.
Totals		Animals treated, 15; cured, 14; destroyed, 1.		

be removed with pumice stone or a solution of oxalic acid. An interesting feature is the amount of heat generated by the oxidation of the salt: I have not had an opportunity of recording the amount, but it is, however, uncomfortably hot to the fingers.

In all the cases shown in the table the disease was verified by microscopical examination. The method of staining the smears was the process used by Mr. Goule, Government Veterinary Surgeon, Natal, which is rapid and gives excellent results, and is applied as follows: A few drops of a saturated alcoholic solution of gentian violet are placed upon the smear with an equal quantity of water. Staining is complete in three minutes, wash, dry, and examine as usual.

A HEN OSTRICH WITH PLUMAGE OF A COCK.*

By F. W. FITZSIMONS.

Director of the Port Elizabeth Museum.

It has long been known in medical science that the human and lower animal organisms have within them a considerable number of bodies known as glands, and that these glands manufacture and store up some special fluid according to their kind, and we have, in many cases, thought we had found out all there was to be known about them. However, within the past year or two a considerable amount of information has been forthcoming in reference to the physiological effects of the secretions of certain of the glands, such as the thyroid in the neck and the adrenal glands on the kidneys.

We have been aware for a considerable time that the glands known as the ovaries produce tiny bodies which, when fertilized, developed living young or grow into eggs enclosed in a shell, but we have not hitherto been aware that the ovaries had any other function. The example which I am about to relate shows conclusively that the presence of the ovaries exerts a mysterious physiological influence, for, when removed, the most astounding pathological effects were manifested.

In April three years ago, at a caponizing demonstration at Graaff-Reinet, at which there were over forty farmers and towns-

* As a sequel to Mr. Elley's article on ostrich castration, the undermentioned cutting from the *Oudshoorn Courant* of September 30, 1912, is of interest.—ED., THE VETERINARY JOURNAL.

men present, Veterinary-Surgeon Elley removed the ovaries from three hen ostriches. The hens were each 4 years of age at the time. Shortly after the operation the three hens began to assume the black body plumage of the adult cock bird, and, from the characteristic drab colour of the feathers of a female these feathers turned jet black and glossy as in the male. Another remarkable thing happened. The wing and tail feathers also changed, and became so like those of the cock bird that feather experts to whom they were shown declared them to be the typical feathers of a cock ostrich.

These hen ostriches belong to Mr. W. Rubidge, a well-known Graaff-Reinet farmer, and he kindly consented to have one of them chloroformed and presented to the Port Elizabeth Museum for exhibition. The bird was sent to us in the flesh, and I had the satisfaction of making a personal examination to make quite sure it was a female. There are many no doubt who will be sceptical, but I can assure them there is absolutely no doubt about the bird being a female. In the accompanying photograph the hen bird is shown after it was mounted by my taxidermist.

It will thus be seen by the foregoing that the removal of the ovaries in these three instances caused remarkable constitutional changes. Hitherto we have supposed the ovaries, as their name implies, were concerned in the production of ova or eggs only, and that their removal rendered the subject sterile. We have here clear evidence that their removal not only does this, but causes the most astonishing changes in the body.

LOCAL ANÆSTHESIA.

BY VETERINARY-COUNCILLOR VAETH.

Heidelberg.

(Continued from page 381.)

IV.—GENERAL TECHNIQUE.

BEFORE an operation one has to determine whether narcosis or a local anæsthesia will be best, for it always causes a bad impression if painlessness is not produced. Before we give the injection we must above all make the syringe aseptic, and the best is the so-called "Record" syringe. We detach the parts from each other and put them in 0.5 per cent. hot salt or weak soda solution and leave them in for five minutes after the solution begins to boil. When cool we put the parts together and wash

the syringe out with sterilized water if soda solution has been used, since soda irritates the tissues and produces decomposition of the solution. After use the syringe is well cleaned and the metal lubricated with vaseline or paraffin. Of cannules one uses different lengths and widths. The best and most durable are platina-iridium ones, which do not rust and can be heated. After use they are flushed with alcohol and also the exit of the barrel of the syringe.

As regards solution, a 2 per cent. and a 1 per cent. novocain solution in physiological salt solution is advisable. He who operates rarely will find the tablets prepared by Merck very useful. One per cent. solution suffices for minor surgery. Two per cent. solution is only used for the interruption of conductivity in large nerve trunks, chiefly those of the extremities. In all operations in which over 50 c.c. of solution is to be used we take, instead of 1 per cent., 0.5 per cent., and where one needs over 100 c.c., 0.25 per cent. solution. Of synthetic suprarenin we give from 1 to 4 drops up to 10 c.c. of a 1 in 1,000 solution in customary operations, and ascend up to 15 to 20 drops as a maximum if large quantities of solution are used. Only in conduction anæsthesia of large nerve trunks we add 1 to 2 drops of suprarenin to each 1 c.c. of a 2 per cent. novocain solution. Since only a little (about 5 to 10 grm. in horses) is injected no poisoning is to be feared. Warm solutions act quicker than cold ones.

He who adopts Schleich's method and infiltrates the tissues in layers with novocain needs 0.5 per cent. solution in minor operations and 0.25 per cent. in major ones.

In all methods a certain time of waiting is necessary and in conduction anæsthesia until complete painlessness occurs. Not a few mishaps are due to the impatience of the operator. One need have no anxiety that one will exceed the proper time, for, with the addition of suprarenin, anæsthesia persists for a long time. The duration of anæsthesia increases with the concentration of the solution, and amounts, according to Braun, to fifteen minutes with a 0.1 per cent. solution, and to about twenty-five minutes with a 1 per cent. solution.

The injection should usually only be injected into healthy tissue and about 1 to 1.5 cm. away from the spot to be operated on; it is important to avoid inflamed tissue.

When injecting, and in order to avoid a quick poisonous absorption from a vein, one keeps moving the cannula continuously backwards and forwards; and by taking away the syringe from the cannula one can see whether blood flows from it or not. The injection place is previously disinfected; afterwards it is protected with collodium, airol paste, or by bandaging.

V.—ANÆSTHETIZING THE SKIN AND THE VARIOUS TISSUES.

The skin is an organ extraordinarily sensitive to pain, and is made painless by terminal or conduction anæsthesia. In the former method the solution (0·5 to 1 per cent. novocain solution) is hypodermically injected, whilst the fine needle is introduced parallel to the surface of the skin, if possible by raising a fold of skin. It is possible to make the first puncture painless with ethyl chloride spray. Suprarenin is not added, or at any rate only by drops.

But to-day the skin is chiefly rendered non-sensitive by means of anæsthesia introduced into the subcutaneous cellular tissue by direct contact with the nerve-endings which lead to the skin or the subcutaneously situated organs. The introduction of the needle may be made by one or two punctures opposite to each other, or one may inject the subcutaneous tissue in the form of a triangle or rhombus. As a solution 0·5 to 1 per cent. novocain solution with suprarenin may be used.

As it is necessary not only to operate on the skin, but often deeper down in order to remove tumours, foreign bodies, glandular swelling, &c., in such cases we must puncture round these structures in a semi-circular or pyramidal shape to infiltrate them, and make all sensible nerves in the field of operation non-sensitive. The peripheral parts will become anæsthetized before the central ones because the deeper nerves have a stronger nerve sheath. Where we cannot get under the tumour to be operated on with our solutions we cannot produce painlessness. This is eventually possible by Schleich's layer infiltration.

It is important where one has several layers of tissue to infiltrate to make a rule of infiltrating the deep parts first, and then to pass on to the superficial ones.

Tendons and muscles are not sensitive, but their surrounding connective tissue and aponeuroses, on the contrary, are very much so. Therefore we infiltrate the connective tissue according to Schleich.

For anæsthesia of the bones we inject round the part to be anæsthetized from all sides. Then we go deeply and plentifully down on to the periosteum, but not under it, and here also we inject the deeper layers first, and then the subcutaneous tissue. Thus also we deal with cartilage and perichondrium.

VII.—PROCEDURE ON DIFFERENT PARTS OF THE BODY.

I have operated about the head for swellings, melanoma, fibroma, opening of the salivary duct, both by infiltration, according to Schleich, and circular anæsthesia.

In operations on the eyelid, en- and ectropium, a stripe-shaped infiltration along the upper or lower bony orbital run suffices to produce anæsthesia of the lid.

On the ear it is oftentimes desirable to operate and work in a painless manner, *e.g.*, for otitis, hæmatoma, wounds, &c. For this object one makes the part concerned painless by subcutaneous infiltration. If one desires to anæsthetize the whole shell of the ear one infiltrates round about its base subcutaneously with 1 per cent. novocain suprarenin solution. Since the large branches of the nerves enter the ear from beneath, it is advisable to inject in a semi-circular form under the base of the ear.

For anæsthetizing the external auditory meatus, one introduces a piece of wool soaked in the following solution : acid carb. liq. 0·5 ; cocaine hydrochlor. ; menthol aa 2·0 ; spirit 10·0. At the neck circular anæsthesia is generally used. At the Cancer Institute here I have seen a whole gland excised from a dog under this anæsthesia. The heart was in such a state as to render general narcosis inadvisable. The solution used was 1 per cent. novocain solution with the addition of two drops of suprarenin up to 10 c.cm. Tracheotomy and opening of the larynx is made more simple by circular anæsthesia.

In removing the vocal pouch for roaring, Eberlein uses a solution of novocain-adrenalin (50 gr. of a 5 per cent. solution) and makes the pouch painless by swabbing. In human medicine the superior laryngeal nerve is anæsthetized by conduction anæsthesia, and analgesia of the whole of the larynx is brought about by a 0·5 per cent. novocain suprarenin solution copiously injected.

On the lower chest and abdominal wall the benign and so-called mixed tumours are suitable for local anæsthesia by injections round

about them. In this way the whole mamma of a dachshund was removed at once.

The mucous membrane of the urethra may be anæsthetized before catheterization by injecting a 2 per cent. novocain solution slowly with a suitable syringe until the urethra is full, for which 25 to 100 c.cm. of solution is necessary. The catheter must be fastened on the point of the syringe, so that no solution runs away. Analgesia sets in in 10 to 15 minutes. For urethrotomy the urethra is first of all anæsthetized in the way described, and then the whole field of operation deeply injected round about in a circular fashion. One notices on section that the dissection in layers must be made somewhat longer towards the exterior, so that no trickling of urine can occur.

The mucous membrane of the female urethra and its neighbourhood may be anæsthetized by a rod surrounded with a tampon that has been soaked in 2 per cent. novocain solution; small tumours may be injected circularly.

For castration one must infiltrate the connective tissue of the scrotum to a level which runs as high as possible perpendicularly over the spermatic cord. Generally two points of injection suffice, one at the root of the hinder part of the scrotum, and another for the injection into the spermatic cord. This method has served me well in castrating cats. The dose of novocain and suprarenin is 1 to 3 c.cm. of a solution of 0.01 to 0.02 : 3 to 5.00 of water. In three-month-old cats the injection causes unrest and increased irritability. After eight hours recovery and great appetite for food.

Also, the rectum can be made painless, if one introduces the needle four times round about it about 1 cm. from the anal edge, and infiltrates 1 per cent. novocain solution. Painlessness after ten minutes. The amount of solution is rather more.

There are, naturally, a number of operations in which local anæsthesia may be used. We will only treat of its uses in the extremities, where in many cases, namely, in hoof, limbs, and sinew ailments, it may be recommended, and produces striking results.

The veterinary surgeon should use Esmarch's bandage in conjunction with local anæsthesia, since thereby the pain is not only lessened, but great bloodlessness, and a better oversight of the field of operation may be secured.

For anæsthetizing the plantar nerves, the solution is injected immediately over the fetlock joint externally and internally. For

this object the skin over the nerves is lifted in a parallel running fold and punctured from above or below. Any hæmorrhage destroys the anæsthesia or renders it incomplete. After emptying the syringe the place is compressed with the finger. The point of puncture is afterwards covered with collodion, or enveloped in a protecting bandage.

If one wishes to make the limb painless higher up, then the median nerve must be anæsthetized. This nerve, as is known, arises from the axillary plexus and passes, accompanied by the brachial artery, to the foot. At the elbow-joint it runs along with the blood vessels and is covered by deep fascia. The nerve as a rule lies somewhat in front of the forearm, and on a limb placed on a shoeing block may be felt deep down as thick as a lead pencil, if one slides and presses the finger from before to behind over the whole breadth of the elbow-joint. One stands in front of the shoulder of the twitched horse and seeks out as high as possible the pulsating median artery, covers it with the two first fingers of the left hand and inserts the needle slowly right up to the finger points on to the bone between the artery and nerve, but care must be taken not to impale the nerve, since, if this occurs, the horse will object strongly.

In the hind limb it is sometimes necessary to make the tibial nerve insensitive. This nerve, a continuation of the ischiatic, runs with the tibial vein on the inside of the thigh downwards in front of the Achilles tendon. It is reflected from the middle layer of the fascia of the lower part of the thigh. Close over the hock it divides into the lateral and middle metatarsal branches. The infiltration place is situated a handbreadth above the point of the hock on the inner side of the leg, and really between the thick flexor tendon and the Achilles tendon. Its situation is easier located on the flexed than extended limb; to accomplish this one seizes the tibia with the left hand from behind so that the thumbs lie on the medial and the four fingers on the lateral side. One now grasps with the fingers anteriorly the thick flexor muscle, presses the fingers together moderately firmly, and in this position draws the hand slowly backwards. Immediately behind the muscle, and between this and the Achilles tendon, the nerve slips under the fingers as a perceptible ridge as thick as a lead pencil. The cannula, after preparation of the region of puncture, is inserted perpendicularly into the raised skin and slowly pushed in until the resistance

due to the fascia of the lower thigh ceases. The point of the needle is now under the fascia in the connective tissue surrounding the nerve. At the best anæsthesia in case of need must be carried out with the limb stretched and the corresponding fore limb of the twitched horse lifted up. The deep peroneal and the fibula nerves may be reached above the hock joint in the groove between the ligaments of the long and lateral extensors of the digit. The needle is inserted under the fascia between both ligaments near to the edge of the long extensor muscle. It is pushed about 2 cm. deep obliquely through the fascia from beneath to above.

The twitched horse for this is placed against a wall, the hind foot stretched and the corresponding fore limb raised.

Thus it may be seen that local anæsthesia is of great advantage to the practical veterinary surgeon, and that he is able to conduct operations alone or with few helpers, and in case of need casting or other aids may be employed.—*Deutsche tierärztl. Woch.*

G. M.

THE MANY-SIDED DUTIES OF A CERTIFICATED "SALUTRI."

IN India the natives are allowed to attend certain courses of instruction at the Veterinary Colleges and other places, and certificates are given when they have attained a certain proficiency. They afterwards practise their art wherever they think fit to settle down, and doubtless many of them make a decent livelihood. Their attempts to attract custom are original and amusing, and the undermentioned pictures are taken from a large series of some forty of a similar class, all highly imaginative and illustrative of wonderful operations performed and wonderful cures attained. They were published in series in almanac fashion suitable for framing, and were accompanied by most marvellous testimonials.

The talented author, however, emphatically declines responsibility for any deaths and inserts the following in a prominent place, the words being spelled as here :—

"NOTICE.

" 'NO CURE NO PAY.'

" I am not responsible of the Death."

" The undersigned is the quified Salutri of Babugarth department.

" Fee of treatment depends on examining the sickness of animals.

Rs.5s. will be charged in testifying whether the horse is sound or unsound. In cases of calling on me to examine the sickness only Rs.1s. And if taking me to gentlemen's house Rs.2s., except the fees of treatment.

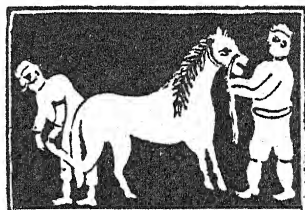
"Yours faithfully,

"AYOUB KHAN SALUTRI."

His certificate of eligibility to perform the duties of "Salutri" and castrator was obtained after attending a course from June 1 to July 31, and after having passed an examination on August 1, this being signed by two veterinary surgeons.



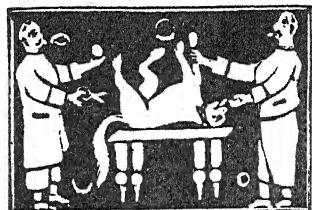
The Bitch of Capt. **YENN ELLIS** Esq.
128 Pioneers treated for Uriamia.



The Mare of major **W. M. SUTTON** Esq.
Centl. Magistrate treated for thrush.



The bitch of **W. M. MAULEUD** Esq.,
Captain 31st D. C. O. Lancers, treated
for intestinal worms.



A fibrous tumour was taken out from the
Bitch of Capt. **H. BROKESMITH** Esq.,
7th R. F. A.

Apparently, if the illustrations are to be believed, the gentleman established his footing amongst a very distinguished *clientèle*, and had success in his operations beyond all the dreams of Western practitioners. A few selected testimonials are as follows :—

"Ayoub Khan, assisted by his son Moshud Ali, has treated dogs of mine for various complaints since my arrival in India. In one or two cases the illness was of a rather serious nature, but Ayoub Khan has been uniformly successful, and I can confidently recommend him as a thoroughly practical and skilful 'dog doctor,' with nothing of the 'quack' about him.

"CAPTAIN, 31st D.C.O. LANCERS."

"Ayoub Khan has attended my horse for a year with uniform success. I have a very high opinion of his veterinary qualifications and skill.

"W. H. C.—Collector."



The Horse of Prince **M. MUSAKHAN** Heir Apprent, to the throne of **Kabul** is being Stitched the shaft had Pierced through his Flankh.



THE DOG OF **H. H. THE LIEUT. GOVERNOR** OF **U. P. & OUDH** TREATED FOR FEVER.

"I have employed the firm of Ayoub Khan and Moshud Ali as veterinary surgeon, on several occasions and have always found that they did the work required in a satisfactory manner.

"L. S.—District Judge."

Two testimonials are from reigning princes, and numerous others from Army officers ranging in rank from lieutenant to colonel, all testifying to Ayoub Khan's skill, gentlemanly manner and common



**THE BITCH OF LIEUT. COL. W. S. MORDALLS
Esq., 31st D. C. O. LANCERS. OPERATED FOR
AN ABSCESS.**



**THE DOG OF MAJOR G. F. T. MURRAY Esq.,
DIVISIONAL TRANSPORT OFFICER 7th MEERUT
DIVISION, OPERATED FOR WARTS.**

sense. Apparently for a "Salutri" with good, shrewd common sense and a natural aptitude for veterinary work, there is an excellent chance to make a good living in India.

Clinical Articles.

THE TREATMENT OF TETANUS IN THE HORSE.

By L. J. KELLY, M.R.C.V.S.

Calcutta.

SOME months ago a contributor to THE VETERINARY JOURNAL, in advocating the use of liq. ferri perchlor. fort. in the treatment of tetanus, had asked the opinion of others who have used it. I have since had an opportunity of trying it in three cases, and herewith give a short note on each :—

(1) *Subject.*—Bay waler gelding, aged. Admitted March 3, 1913, having walked some distance to hospital.

Condition.—Trismus slight, difficulty in movement and protrusion of membrana nictitans marked.

Probable Mode of Entrance of Infection.—Slight wound at heel caused by nail.

Treatment.—Rectal contents evacuated by hand. Rectal injection: Liq. ferri perch., 1 dr. ; aqua fervens, 1 pint, three times a day ; hydrarg. subchlor., 4 dr. in mash.

Progress.—March 4.—Liq. ferri perchlor. fort. used to-day and subsequent days instead of liq. ferri perchlor. Hydrarg. subchlor., 4 dr. in mash.

March 5 : Treatment same, condition of animal unaltered, feeding well.

March 6 : Hydrarg. subchlor., 4 dr. in mash. Symptoms more pronounced.

March 7 : Hydrarg. subchlor., 1 dr. in mash.

March 8 : Hydrarg. subchlor., 1 dr. in mash. Refused evening meal ; trismus more marked.

March 9 : Partook sparingly of mashes ; symptoms much aggravated, respirations rapid.

March 10 : No food taken. Tottering to a fall.

March 11 : No food taken. Tottering to a fall. Quite unable to move.

March 12 : No food taken. Tottering to a fall. Quite unable to move.

March 13 : Feeds sparingly. Slight improvement noticeable.

March 14 : Improving, feeding well.

March 15 : Much improved, injections discontinued.

March 16 : Much improved, injections discontinued.

March 17 : Improvement not maintained.

March 18 : Injections resumed once daily. Hydrarg. subchlor., 1 drn.

March 19 : Symptoms still marked. Injections continued once daily.

March 20 : Symptoms still marked. Injections continued once daily.

March 25 : Symptoms still in evidence, marked difficulty in turning, sensitive to the slightest noise.

March 26 : Animal found down early morning and expired shortly afterwards.

(2) Chestnut waler gelding, aged 6 years. Admitted March 6, 1913.

Condition.—Some difficulty in moving. Symptoms not so marked as in Case 1. No appreciable wound.

Treatment.—Rectal injections, liq. ferri perchlor. fort. as No. 1. No calomel. Bran mashes, which he partook of freely. Seen at 8.30 p.m., and was then same as when admitted in the morning.

March 7 : 6 a.m. found dead.

(3) Brown waler gelding, aged. Admitted June 12, 1913.

Condition.—Symptoms only slightly in evidence.

Probable Mode of Entrance of Infection.—Wound on elbow.

Treatment.—Liq. ferri perchlor. fort. per rectum, as Cases 1 and 2. Hydrarg. subchlor., 4 drn. in mash.

Progress.—June 14 : Patient found cast in box this evening, and was with much difficulty got on feet, when it was seen that the symptoms were much aggravated. Chloretone, $\frac{1}{2}$ oz. (P.D.), given to bolus.

June 15 : Rectal injections discontinued.

June 16 : Chloretone, $\frac{1}{2}$ oz., in bolus, and no further treatment.

July 8 : Recovery complete.

A MULE FOAL.

BY MAJOR W. M. BOLTON.

Troodos, Cyprus.

It may be of interest to your readers to know that a mule (mare) in this island has dropped a foal which is healthy and somewhat resembles a small donkey. The mule is $13\frac{1}{2}$ hands, and 6 years old. It is stated by her owner that she previously dropped a foal, but that it only lived a few days.

The Government Veterinary Surgeon (Mr. W. Harvey, M.R.C.V.S.) has examined the animal and states that there is no doubt that it is a mule.

OPERATION FOR CRIB BITING.

BY VETERINARY SURGEON STENERSEN.

Sarpsborg.

THE defect of crib biting is in many cases curable by operation. Professor Vennerholm mentions it in his lectures and text-books, and Professor Mörkeberg recommends it as a result of his experiences. He noticed in one horse that was a bad crib biter that the vice disappeared after operating, and that the horse did not exhibit the defect during the subsequent three years that it was under notice. In other cases the crib biting was much less after the operation. The procedure consists in double-sided neurectomy of the N. accessorius Willisii, and either in neurectomy alone, or in conjunction with myotomy of the sterno-hyoid and thyroid muscles. Professor Mörkeberg has found such a combination of neurectomy and myotomy more successful than neurectomy alone. As a result of the favourable anatomical conditions the operation is easily carried out. The N. accessorius lies in the loose connective tissue of the inner side of the sterno-mastoideus. The skin incision is made along the upper edge of this muscle. It begins above at the place where the vena maxillaris externa crosses its tendon about a handbreadth beneath the lower edge of the jaw. The sterno-hyoideus and thyroideus muscles lie along the anterior and lateral surface of the trachea. They are a pair, and united with each other by a short tendinous portion in the middle. At this spot section may be successfully performed. In front and round these thin muscles lies the sterno-

mastoideus, together with panniculus carnosus and fascia. This must be penetrated in order to find the spot to divide. The above-mentioned muscles are easily found in lean animals, but rather more difficult in fat, coarse, and thick-necked horses. The field of operation is shaved, disinfected, and injected with a solution of hydrochlor. of cocaine and adrenalin, the injection being made a handbreadth beneath the lower edge of the jaw and along the easily felt edge of the sterno-mastoideus muscle. A quarter of an hour after an incision is made through the skin and fascia. A quite bloodless, plainly revealed field of operation is then disclosed. By means of an arched forceps the wound is held open, and the underlying tissue raised and the nerve found. One must be careful to introduce the forceps well into the wound and to raise up the tendinous portion of the sterno-mastoideus, and thus to press on the under edge of the wound. One is then certain to find the nerve. The nerve is then dissected out and cut through at the upper and lower angle of the wound, and thus a piece of nerve 1 in. to $1\frac{1}{2}$ in. removed. A suture is then put in the wound. Myotomy is then performed twenty minutes after deep injection of the muscles with the local anæsthetic. The incision in the neck is made in the middle line at the boundary between the upper and middle thirds of the neck. The sterno-hyoideus and thyroideus are loosened from the trachea, which lies immediately beneath them, drawn up out of the wound, and cut through. A counter opening is made at the lower angle of the wound to allow for drainage and the operation wound sutured.

The results in six cases were as follows:—

(1) Neurectomy failed, myotomy succeeded. The animal cribbed no longer.

(2) Cribbed immediately after neurectomy and myotomy. Ceased eight days after. Later on began again.

(3) Four-year-old mare cribbed every day for six months. Ceased cribbing after the operation, and was all right eight days later.

(4) Brown gelding cribbed immediately after the operation, but not a few days later.

(5) Grey mare, 7 years old. Nothing known.

(6) Brown gelding, 4 years old, cribbed for two years. Immediately after the operation he cribbed; a while later he bit the edge of the crib, but could not get hold.—*Deutsche tierärztl. Woch.*

SYMPTOMS OF POISONING IN HORSES AFTER THE
USE OF LATHYRUS SATIVUS.

BY CHIEF VETERINARY SURGEON SZCZEPAUSKI.

At the beginning of October, 1911, I was called to see two previously healthy horses which for some days had shown the following symptoms: During work difficult respiration, roaring and spinal paralysis; when resting no signs of any general illness were apparent.

Close examination on leading one horse out showed partial paralysis of the hind quarters, announced by a tottering uncertain gait. At the trot the hind quarters swayed considerably to both sides. On turning the loss of equilibrium became so pronounced that the animal threatened to fall. Both at the walk and trot roaring and difficult respiration occurred. The breathing, accomplished with whistling and roaring sounds, was laboured and executed with pronounced movements of the ribs and flanks and marked dilatation of the nostrils. The second horse showed slight difficulty in breathing at first, and on further movement began to roar with threatening suffocation until the trotting was stopped. The tongue hung out of the mouth and was bluish-red in colour. The distressed breathing continued for about ten minutes, and then the horse recovered gradually and was led back to the stall. A third horse, not further examined, showed roaring symptoms after eating hay.

On the ground of previous experiences with chick-pea and chickling-vetch feeding in horses the conclusion was come to that these animals were suffering from so-called "lathyrismus."

Subsequent inquiries showed that thirteen horses had received sufficient quantities of good hay for $3\frac{1}{2}$ months, and besides concentrated food of oats and peas amounting to 25 lb. of corn to each horse.

Among the peas, which amounted to $6\frac{5}{8}$ lb. of the day's corn food, could be found small, angular, laterally compressed, hatchet-shaped seeds of yellowish-white colour, which were recognizable as lathyrus sativus. These peas formed 15 to 20 per cent. of the fodder peas, so that each horse was getting 1 to $1\frac{1}{2}$ lb. per day of the injurious legumes. To the whole stud 110 cwt. of the above pea mixture had been given during $3\frac{1}{2}$ months' time. Although immediately after detection of the cause the feeding

of the injurious peas was stopped, yet a few weeks later all the remaining horses showed typical symptoms of the same poisoning. Two horses died under symptoms of suffocation; in others incurable roaring ensued, which necessitated constant use of the tracheotomy tube.

An autopsy of the dead animals was not made by me. According to the report of a veterinary surgeon, there was complete disappearance of the dilators of the glottis in the left side of the larynx.—*Zeitschrift für Veterinärkunde*.

DIPHThERITIC AND ULCERATIVE INFLAMMATION OF THE MUCOUS MEMBRANE OF THE MOUTH IN THE HORSE.

BY STAFF VETERINARY SURGEON DR. HOCK.

LITERATURE is not rich in reports of that diphtheritic inflammation of the mouth in horses which belongs, with the catarrhal and aphthous form, to the non-transmissible organic diseases in opposition to the often-occurring and well-discussed sporadic contagious, pustulous stomatitis of the horse.

In Dreckerhoff's "Pathology and Therapy" diphtheritic disease of the mucous membrane of the mouth is not mentioned at all. Friedberger and Frohner on the contrary, in their "Pathology and Therapy," include it in the non-contagious organic diseases.

In October, 1912, among eight heavy Danish draught horses a 6-year-old brown gelding was always foaming at the mouth and salivating; the appetite was good, food was seized, but it immediately fell from the mouth.

On my examination I found the horse in very poor condition. It was so emaciated that all its bones were visible. The coat was lustreless and dusty. Aspect and movements of the horse were listless and lifeless.

Body temperature, pulse and breathing were regular; the lymphatic nodules in the gullet were somewhat enlarged. From both angles of the mouth strings of saliva escaped. The lips were thick and tumefied, and at the angles of the mouth the mucosa was everted and showed a bluish-red colour. When the mouth was opened with a gag a great quantity of saliva which had collected in the cavity was evacuated. Further, on the

mucosa of the right cheek, not far behind the angle of the mouth, a place as big as a hand-plate was denuded of epithelium. The irregular jagged edge was sharply defined, and the epithelium at its edge showed a greyish-white washed-out appearance. The remaining mucosa was inflamed and hot. A level small area about the size of a 5-mark piece was noticeable at the toothless edge of the left branch of the underjaw and extended on the inner side over the base of the tongue and on to its lateral surfaces. The upper edge of the jawbone was free. On the lateral and under half of the tongue there were places as large as a pfennig piece, which were almost, except for a small spot in the middle, covered with epithelium, which had the above-mentioned greyish-white washed-out appearance. Finally, on the toothless edge of the right branch of the underjaw, close to the first back tooth, there was a flat, sensitive-to-pressure swelling about the size of a 25-pfennig piece, the epithelium was grey and the surrounding tissue was inflamed. On the following day the epithelium was cast off so that the dark-red coloured layer beneath was exposed.

Pathologic-anatomically the changes were due to superficial ulceration of the mucosa, which arose from diphtheria of the epithelium and increased by necrosis of the epithelium at the edges. The larger ulcers were caused by coalescence of several small ones, or also by further rodecy of single small ulcers. The deep destruction of the mucosa of the left underjaw was due to the effect of the snaffle bit. The other symptoms were due to the irritation caused by the ulcers.

As regards causes, literature advises examining the food-stuff. The oats and straw were of good quality. As rough food Timothy and clover hay were given. The Timothy was pale and straw-like in colour, had a musty smell and, as its ripe condition showed, had been cut too late. It was evidently more than a year old, very hard, prickly, dry and brittle, and when shaken emitted thick clouds of dust. The clover hay was dark brown in colour, felt damp and smelt fusty. I ceased giving this fodder, which the horses had taken well but which had frequently caused colic.

Under these circumstances there was no doubt the complaint was due to the spoilt hay, and probably due to mould fungi causing disease of the mucosa in one horse and colic in others.

As treatment, the bad fodder was discarded and good meadow hay substituted. The colic ceased, and the stomatitis and general condition of the ailing horse gradually improved. The mouth of the horse was also washed out several times daily with liquor aluminii acetici, and the ulcers at each washing were painted with tincture of iodine and later on with tincture of myrrh and aloes. Complete healing of the ulcers occurred in eight weeks.—*Zeitschrift für Veterinärkunde.*

NEW CLINICAL INFORMATION CONCERNING COLIC IN THE HORSE.

(From the Clinic of the Veterinary College in Berlin.)

BY PROFESSOR DR. FROHNER.

THE author recounts his experiences on 1,000 cases of colic in the medical clinic and refers to the etiology, diagnosis, and therapy of the complaint.

In reference to Marek's stomach catheter he has used it repeatedly in the clinic, both in primary and secondary dilatation of the stomach. In primary dilatation the success was good, but not so in secondary. The confusing of these two conditions has a tendency to bring this method of treatment into disrepute.

The distinction between primary acute dilatation of the stomach and secondary presents greater diagnostic difficulties than the diagnosis of acute dilatation of the stomach itself. Primary dilatation is evinced firstly from anamnesis. If acute dilatation of the stomach sets in soon after the commencement of colic, or fermenting indigestible food is given, or sudden changes of food occur, or severe exertion previously, especially in the hot time of the year, then one must bear in mind primary acute dilatation in so far as rectal examination is negative. It is well to bear in mind that stoppage of the intestine may occur independent of acute dilatation of the stomach, which may be relieved by treatment, whilst the animal as a result of the stoppage may have a second tympany of the stomach, and finally succumb to rupture of this organ. F. relates that four cases in which the animals resented the introduction of the catheter were cured by arecolin.

Notwithstanding he advises the use of the stomach catheter in all employable cases. In general it may be said that the attack continues longer the further back the inert mass is situated. In duodenal stoppage it (dilatation of the stomach) occurs in two and

a half to four hours after the commencement of colic, in one case of adhesion of the jejunum to the diaphragm after five hours, in stoppage of the stomach-like dilatation and the left under aspect of the colon after nine to fifteen hours. Rupture of the stomach occurred the earlier the nearer the situation of the stoppage to the stomach. Death occurred one to six hours after rupture. As regards stoppage of the colon, of 634 cases of colic in the years 1911 and 1912, the colon was involved 271 times, of which 75 cases proved fatal. The mortality from simple impaction in most cases in the lower accessible section of the colon amounted to 5·8 per cent., that of the cæcum, on the contrary, to 17·9 per cent. Of 15 horses with impaction of the stomach-like dilatation 13 died, or 86 per cent. For diagnosis of stoppage of the colon the insidious course of the colic, the gradual retardation of defæcation, the pawing at times, and the frequent assumption of the dog-sitting posture, especially in impaction of the stomach-like widening, as well as the long time normal pulse, temperature, and breathing, are all valuable. A certain diagnosis is always possible by rectal examination, and especially, almost without fail, in impaction in the left segment of the colon; palpation cannot, however, be carried out frequently. Impaction of the large colon, contrary to that of the small bowel, lasts several days. Prognosis is favourable. In the clinic aloes is chiefly used as a remedy—especially effective is an injection of arecolin 0·05 at the time at which one expects the aloes to act (twelve to twenty-four hours).

Impaction of the cæcum, on account of the distinct symptoms, is easy to distinguish from the remaining impactions. Already anamnesis (long continuance of colic, at times not great unrest, frequent lying, at times returning appetite) demonstrates chronic cæcal stoppage conclusively. Other symptoms are stretching to urinate, moderate unrest at time of attack, lying on the side and breast (seldom on the back and in dog sitting posture), appetite and thirst not at all or only slightly in abeyance. On using purgatives, thick pulpy dung. Rectal examination reveals in most cases in the right upper flank region the child's head to man's fist roundish swelling, with two perceptible tæniæ of flat surface which are not painful on pressure. The prognosis of cæcal impaction is doubtful. Aloes and arecolin are useful here.

Impaction of the duodenum generally ends fatally in less than eight hours.—*Monatshefte für praktische Tierheilkunde*, 1913.

ENTROPIUM SPASTICUM IN A HORSE.

BY CHIEF VETERINARY SURGEON BECKER.

AN officer's horse, 18 years old, was brought to me suffering from catarrhal conjunctivitis and keratitis. Tumefied tissue protruded from the eye in attempting to open the lids. Patient endeavoured to rub the eye against the manger and wall, and resented any examination. Compresses and irrigation with 2 per cent. boric acid solution, and dropping in half per cent. sulphate of copper, sulphate solution and subsequent syringing out with common salt solution, caused betterment in fourteen days.

Shortly after, the complaint became aggravated. Purulent secretion became copious and the eye closed. It was now decided that only an entropium operation would bring about a cure, and on the fourth day, after allaying the irritable state somewhat, an operation on the standing horse was undertaken. Local anæsthesia was produced by a subcutaneous injection of adrenalin-cocaine. Ten minutes afterwards the hair was shaved and the field of operation disinfected. Then the directions of Pfeiffer and Frohner were followed—"with a hooked forceps midway between the inner and outer canthus, the skin of the upper eyelid was raised in a parallel fold so large as to bring the internally inverted edge of the lid to its normal position." Then a piece was snipped out so that the skin between the lid and edge of the wound was about 7 mm. broad. The form of the wound was elliptical with a horizontal diameter. Bleeding was trivial. The edges of the wound were united with button sutures. The upper edge of the lid now seemed in its normal position and the entropium remedied. The eye was covered with gauze kept in position with a linen bandage.

On the fourth day, however, the defect appeared to be only partly remedied; the eyelashes and upper edge of the lid were again inverted, and as no improvement was evident on the eighth day a second operation was carried out. This time a piece of skin was taken away, so that after the insertion of the button sutures the upper edge of the lid was slightly everted (ectropium) and the operation was concluded as before. The ectropium was somewhat more pronounced next day, but after eleven days only a narrow cicatrix remained and the result was successful. No complications have since occurred and the horse has done his regular work at shooting practice and manœuvres. The cause of the entropium was

due to the horse rubbing the eye on the manger and wall, and this acted reflectorily on the membrana nictitans ; as a result the globe of the eye was retracted more and more by the musculus retractor bulbi. The resistance of the elevator of the upper lid was thus lessened and the edge of the upper eyelid was inverted. The lashes and hair of the inverted lid by their irritation aggravated the conjunctivitis and brought about inflammation of the cornea.

It would seem that in operating it is best to take out a sufficient quantity of skin, and to have slight ectropium present at the conclusion of the operation and that this slight ectropium soon disappears. This circumstance is perhaps due to the fact that the bulb of the horse's eye is not ball shaped as in the dog, but that its anterior and posterior face are bevelled.—*Zeitschrift für Veterinärkunde.*

THE ASEPTIC EXARTICULATION OF THE CLAWS OF CATTLE.

BY DR. A. SALVISBERG.

THE affected foot is repeatedly washed with soda and cleansed with soap and water on the day before operation by the owner, and afterwards wrapped in cloth soaked in dilute creolin. Shortly before operating the animal is narcotized, whilst it receives, according to age and size, 2 to 3 litres of brandy with an equal quantity of water. It is then cast, and the three healthy limbs bound together with cords. The foot to be operated on is fastened to a stake or post, whilst the tarsal or carpal joint is bound with the lower plate (to render the joint immovable) across the stake. Under the shin bone a sack filled with straw is placed as a support. With the help of Esmarch's bandage and tourniquet the blood is driven out of the extremity and the hair about the posterior digits shaved, the field of operation is rinsed with boiled water and afterwards rubbed with ether-alcohol, equal parts, and sterile wadding. Now the operator thoroughly disinfects his hands. Then an inverted T-shaped incision is made beginning over the fetlock joint and running in the direction of the extremity ; the horizontal one, beginning at the balls of the heel, passes the length of the coronet at the junction of skin and horn to the cleft of the hoof and through this again to the balls. At the same time the hard skin which covers the cleft must, if possible, be spared. Consequently, the incision must be made so near to the horn of the claws as to allow of a broad seam making the sutures exact and solid. The angles of both wound flaps are drawn well up

with a pointed hook. The skin is dissected away with the balled bistoury and drawn apart. The pus from the fistulous openings is not rinsed away, but carefully taken up with swabs. Then the point of the diseased claw is grasped, moved forwards and backwards, and now where the groove or fold shows is penetrated in the fetlock joint and exarticulated. At the same time the cartilage of the joint is spared as much as possible. The first phalanx is now drawn as high as possible, and with a few cuts separated from the other fetlock bone. After removal of loose tissue and fatty padding the fistulous opening in the skin is cut round with the probe-pointed bistoury and painted with tincture of iodine. Then where both incisions meet at the point of both triangles, the first button suture, which at the same time serves as a situation suture, is put in. After finishing suturing, the field of operation is dried, rinsed with iodoform ether, and covered with iodoform gauze and wadding, and a pressure bandage of oiled silk put on. Over the whole is placed a bandage of linen sacking. After four or eight days the bandage is renewed as before described. At the second changing of the bandage the sutures are removed, and any protruding granulations pencilled with copper sulphate. Eight days after the last change of bandage the wrappings are wholly removed and the wound painted by the owner with liquid tar and tincture of iodine.

The favourable result of the operation depends much on the thorough disinfection of the hands of the operator and the instruments, as well as in the fact that the operator has not conducted a septic operation one or two days previously.—*Deutsche tierärztl. Woch.* ex *Schweizer Archiv. für Tierheilkunde.*

AN EPIDEMIC AMONG GOATS.

By L. J. KELLY, M.R.C.V.S.

Calcutta.

In the month of April last I was asked to attend to some goats, the property of the Dutch Government, which were standing at the docks here, and, having been purchased up-country, were awaiting shipment to Java with the object of improving the strain already existing there. The history that I got at the time was that four of the animals had been found dead over night, and that a number were vomiting and much "blown up." On inspection I found six showing symptoms of marked depression, enlarged abdomen, which on palpation was found not to be due to tympany but to fluid in the

rumen ; diarrhœa was profuse, temperature in nearly every case subnormal, and a certain amount of pain was evidently present ; the respirations were in one case markedly accelerated, and in the others to a lesser extent ; marked thirst was shown by all. Treatment adopted was to separate those showing symptoms from the remainder, which numbered about 250, and which were confined in a small space ; in each case a colic draught consisting of

Spts. æth. nit. ...	...	...	...	...	5ss.
Chlorody. ...	...	...	...	...	℥xx.
Ol. turps. ...	...	...	...	...	℥xx.
Ol. lini. ...	...	...	...	ad.	℥iv.

was administered, followed every four hours by a powder in cold starch gruel consisting of—

Pulv. nucis vom.					
P. ammon. carb.	...	..	...	āā	gr. x.

Water was only allowed in small quantities. The prognosis of one case was bad, of the others more hopeful. Looking about for a cause of the condition, I saw that the feeding troughs were in many cases contaminated by the dejecta of the animals, and I ordered these to be emptied of their contents and cleaned ; but next day on arrival I found that these instructions were only partially attended to, and that three more goats were found dead that morning, tympany of the carcasses being a marked factor. Of those treated on the previous day one had died, the other five survived and were much improved. Believing firmly now that the feeding conditions were at fault (I should here mention that the food given to all the goats was chaff (chopped straw) and gram), I made a closer inspection of the troughs and it was evident that these latter had never been cleaned. The food remaining from the previous meal was never removed, and in every case the fodder was fouled by the urine and fæces of the animals, and fermentation was going on rapidly. I had these conditions altered and no further deaths occurred, and in the course of a few days those which had showed symptoms were returned to normal.

Further Remarks.—It was only adult goats that were affected ; a number of kids amongst the lot never showed symptoms. These goats were many days at the docks before showing symptoms. A number of cattle close by receiving the same rations were not affected. Last season, whilst another lot of 300 were awaiting shipment, thirty died under similar conditions. A *post-mortem* or examination of the blood of those which succumbed was not attempted.

Canine Clinical.

RUPTURE OF THE SPLEEN IN A DOG.

By L. J. KELLY, M.R.C.V.S.

Calcutta.

SOME short time ago I was asked to make a *post-mortem* on a bull dog, aged about one year, which had died suddenly the previous evening after a few minutes' illness.

The carcase was a well-nourished one; there was tympany as was to be expected. On opening the abdomen a large lot of blood was encountered, and on further search the spleen, which was much enlarged, was found to be ruptured longitudinally, all other organs healthy.

There was no history of previous illness or injury.

The owner, a breeder of this class of dog, had lost three or four others under somewhat similar circumstances during the previous twelve months. Could it be anthrax? Was it piroplasmosis? What was it?

Most unfortunately an examination of the blood was not practicable.

Miscellaneous.

PRELIMINARY EXAMINATION IN VETERINARY SCIENCE, JULY, 1913.

PASS LIST.

3901. Bennett, Sampson Charles Jenkin, Birkbeck College and Royal Veterinary College.

3903. Brekke, Harold William, Royal Veterinary College.

INTERMEDIATE EXAMINATION IN VETERINARY SCIENCE (Part 1).

PASS LIST.

3951. Bosworth, Thomas John, Royal Veterinary College.

Abstracts.

REMARKS BY PROFESSOR ANTONINI ON THE ROARING OPERATIONS AND THE CHLOROFORMING OF HORSES.

TRANSLATED AND ABSTRACTED BY I. S. C.

In the mid-June issue of *La Clinica Veterinaria* there is an interesting article by Professor Attilio Antonini, of Milan, who gives details concerning thirteen of the more remarkable cases which he has treated ; he also supplies a table of information regarding the whole thirty operations which he has performed.

Professor Antonini "feels it his duty to add his contribution to the records of this new triumph of our surgical science," as he describes it, and he says that he is all the more persuaded to publish this account of his observations and of the results which he has obtained because the Italian practitioners have not as yet published the results of their experimental roaring operations, although these have not been lacking in Italy any more than in other parts of Europe. Communications, which have appeared in *Il Giornale di Ippologia*, have frequently come from England, France, Belgium, Holland, Germany, Austria and, more recently, from New Zealand, regarding the satisfactory results of the operation. This has been performed in all these countries by the followers of Professor Hobday, to whom belongs the European honour of having first practised, demonstrated, popularized, and also improved upon the procedure of Williams, whose American colleagues adopted the original method and testified to its success from the first.

In Italy, however, since Professor Antonini's first communication to the Congress of Turin (an abstract of this paper was supplied by the present writer to *THE VETERINARY JOURNAL* for 1911), no other author has dealt with the subject except Professor Bernadini, "who, more than anyone else," says Professor Antonini, "has criticized the operation ; for, while acknowledging the progressive value of the operation itself on the treatment of roaring, he proposes a modification of the process which, in his own considerable experience, has been fully successful."

This same professor has also made a special study of the diagnosis aspect on the basis of the measurement of intertracheal pressure, and important discoveries are expected from these particular investigations by his compatriot, Professor Antonini, who declares that : "It would be a splendid thing to have some practical means of establishing with exactitude the diagnosis of paralytic roaring."

On the question of diagnosis Professor Antonini writes as follows :—

"To begin with, whenever it was possible I made a thorough examination of the horse before subjecting it to the operation. Although I had seen twelve operations conducted by Professor Hobday without preliminary examinations, I thought it better for me to confirm, in each of my own cases, the existence of roaring, and to observe its intensity, its characteristics, and all the circum-

stances which might possibly be present. Thus, in one very serious case of roaring which was accompanied by hæmorrhage from the nose and mouth, I decided not to perform the operation. It would have done no good, because, most probably, the roaring was due to the presence of a tumour which obstructed the respiration.

"Edematous swellings in the glottis give rise to symptoms which differ very little from those of paralytic roaring. This, unlike the former affection, is especially manifested during the inspiratory phase of breathing, which becomes noisy after a certain amount of exertion, and is intensified by further exercise."

But the Professor goes on to say: "It is not possible for everyone to have access even to the existing means of differentiating one kind of roaring from another, and even when they are accessible those means of diagnosis are not too easy of application."

The writer acknowledges that he himself is "not as yet successful in ascertaining the cause of roaring through external palpation of the larynx; although Williams says it is possible in this way to diagnose a lateral paralysis by establishing the existence of muscular atrophy."

After the disclosure of so much ineffective striving towards a definite diagnosis there is perhaps a certain naïveté in the following admission:—

"Considering the universally acknowledged preponderance of nerve paralysis over every other cause of roaring, it is quite justifiable to operate in every case, unless there is some very clear indication for the necessity of a contrary diagnosis." "Anyhow," the Italian Professor continues, "as Hobday advised, it would be necessary to open the larynx in order to make a direct examination, and to abstain from operating in cases where the freedom of movement in vocal cords and arytenoid cartilages shows that the roaring does not proceed from paralysis, but from some other cause. I should, however, state that even in such cases Professor Hobday now performs the operation and obtains most excellent results.

"In fact, I also have operated in a similar case, and I did not regret it, because the result was equally satisfactory. In this connection I must report the reply of Professor Bossi, of the Buenos Ayres Veterinary School, to a letter of mine. To begin with, he declares himself in favour of the Williams operation, through which he has himself successfully treated about 250 cases, while his assistants have operated on 150 others. He attributes any lack of success to the operator. Then he comments on the etiology of roaring, the affection being in his opinion due to infection by the *Streptococcus equi*. As a proof of his theory he adduces the intermittence of the symptoms with relation to the toxic action of the micro-organism. He holds that his view is confirmed by direct inspection of the larynx. He also says that after the usual incision in the crico-thyroid ligament has been made, it is not rare to find that the arytenoid cartilages move freely, and that in such cases Bossi has obtained the best results through operating in the Williams manner."

"Although," Professor Antonini remarks, "this is not a suitable occasion for discussing the chloroforming of horses, I cannot do less than notice how much its danger has been exaggerated in Italy, and

how in consequence the use of chloroform in operations has been neglected. In England it may be said that there is not a single veterinarian who cannot obtain the use of some sort of mask for the administration of chloroform ; and it cannot even be denied that he does sometimes apply it in cases where " (in Professor Antonini's opinion) "it could very well be done without. For instance, I remember seeing at the Veterinary College in London a small horse which had been chloroformed for the removal of a little tumour on a tendon.

"Professor Hobday, and he is not alone in this, performs hardly any operation without chloroform, and surely its use in Italy should be encouraged by the knowledge of his operations for roaring on 650 horses, his 160 recorded operations on cryptorchids, and his 70 and more ovariectomy operations on troublesome mares. Indeed, in roaring cases it seems to me that if chloroform is properly given, there is no danger whatever from its administration, partly on account of the short time taken by the operation, and also because when once the laryngeal cavity is opened the chloroform can no longer be absorbed into the respiratory organs, and thus any possible danger is actually obviated."

Professor Antonini's detailed experiences, and his minute instructions regarding operational procedure (even down to the advocacy of a waterproof covering to the bed of straw) are doubtless most instructive and even necessary for the education of his Italian colleagues ; but, since in this country, and especially in this Journal, we have had and can still enjoy first-hand information on these matters, it only remains for us to adumbrate any useful comments regarding the several instruments, the toothed "burr" of Williams, the "thimble" of Cook, the "forceps" of Cadiot, which can be used in the removal of the ventricular mucous membrane ; the simplification and the perfection of this process being the object of the various modifications of the original operation of Williams.

Professor Antonini points out that the modification which is most unlike the original process, and which, as he considers, offers certain advantages, is the cauterization, *in situ*, of the mucous membrane. This is Professor Bernadini's variation. The "burr" modification is really the only simplification of which Professor Antonini especially approves. It was initiated by Blattenberg, an American, and Williams himself has adopted it, carrying it out by means of the "soft rubber burr" which is now substituted for the toothed metal instrument which Williams originally used. The great advantage of the improved instrument is that by its means the mucous membrane, "as if it were the finger of a glove," can be detached, as far as requisite, while no lesions of the organs underneath or adjacent are caused.

Professor Antonini denies the existence of any special danger in the operation. It is true that he had two cases which ended in death, but "these two fatalities cannot," he says, "be attributed to the operation. Death was due, in one case to oedematous infection, beginning in a lesion of the tongue ; a similar accident might occur during any surgical intervention. The second case of death occurred from pneumonia thirty-eight days after an entirely successful opera-

tion which was in no way connected with the subsequent illness." Professor Antonini states that "the percentages of cures vary, according to the different operators, from 40 to 77 per cent. Thus Williams has obtained 77 per cent. of cures, Eberlein 75 per cent., Hobday 66 per cent.; others less fortunate or less expert have obtained smaller percentages of cures. The deaths which have been registered," he says, "are attributable to errors in technique or to accidental illness."

Regarding his own results Professor Antonini says: "They might have been better if I had always been able to operate under favourable conditions. The absence of suitable surroundings, and, above all, of intelligent assistance, must sometimes have interfered with success. Still I can declare myself sufficiently satisfied with the results of my operations on the thirty horses which up to the present I have treated, and I may assert without hesitation that the percentage of my cures is not inferior to those of many others, not excepting those of Professor Hobday himself, who has had the advantage of so much more practice. I am sure I am right without making any exact calculations which could only have but a very relative importance, considering the difficulties I encountered at the beginning of my practice, more particularly through the prejudice of my countrymen against anything which is new. This prejudice accounts for the scarcity of cases with which I have been entrusted. There is also a lack of information about several of my cases. Definite accounts of these might materially alter any statistics that might be made on the present imperfect data.

"At all events, though my results are already very gratifying, I believe that with more practice, and perhaps with an improved and simplified operative process, the percentage of my cures will go on increasing, for I am convinced that:—

"(1) The Williams operation is really efficacious for curing paralytic roaring in horses.

"(2) The operation produces a higher percentage of cures than any other surgical operation that has hitherto been tried.

"(3) Although a delicate operation, it does not present insurmountable difficulties nor special dangers, and it is worthy of the utmost consideration."

REGULATIONS FOR STUDENTS AND VISITING STUDENTS AT THE ROYAL VETERINARY COLLEGE OF HANOVER.

KNOWING that the holiday season is at hand, and thinking that perhaps some practitioners and students might care to visit some of the veterinary schools of Germany (where they will be made exceedingly welcome), the following brief abstract of the regulations for students and post-graduates may be of interest:—

I.—RULES FOR ENTERING AND LEAVING THE COLLEGE.

(1) Students may enter during the first three weeks of the Summer and Winter terms. In certain cases an exception to this rule is made.

(2) Deals with the papers which German students must show on entering.

Exemptions from (1) can only be considered with the consent of the Minister for Agriculture. This is also the case with regard to foreigners who wish to pass the German veterinary examinations, but who do not wish to practise in Germany. Such foreigners are only allowed to join the classes and enter for exams. if they can prove that they have enjoyed at home a school education which would allow them to study at a University or College in their own country.

(3) When the above conditions are fulfilled and the fees paid the student must personally see the Director and agree to the keeping of all rules of the College. On his arrival he receives a list of rules, an identity card, and a prospectus of classes, lectures, &c.

(4) The student must always carry his identity card about with him. He must give notice of his address on his arrival, and communicate any change of lodging to the College Bureau.

(5) If the student intends to leave and continue his studies elsewhere he must get a leaving certificate, for which he is charged a fee (foreigners 20 marks).

II.—FEES AND PRIVILEGES.

(6) The fee for each term is 100 marks (£5), which gives entrance to all classes and lectures. It must be paid in advance, and a receipt obtained from the office.

(7) In certain cases this fee may be paid at the half term.

(8) Besides the fee for lectures, the following additional charges are made: (a) a subscription to the Students' Committee in case one meets; (b) a subscription to Reading Room and to the Students' Sick List; (c) a subscription to Insurance against Accident, the amount of such subscriptions as decided by the Director every term. An entrance fee, which includes the leaving certificate, costs Germans 6 marks, and foreigners 20 marks.

III.—THE LECTURES.

(10) The course of study is determined by the standard of the examination for veterinary surgeons. Students are not admitted to the practical work and demonstration lectures in pathological anatomy, bacteriology, or to the hospital, or "inspection of slaughtered animals" until they have passed a theoretical examination.

(11) The Winter term is generally from October 15—March 15, and the Summer term from April 15—August 15. Students must state within the first fortnight which classes they wish to join.

(12) Students must attend their lectures regularly, otherwise they cannot be admitted to practical work.

(15) Students at the Veterinary College may join classes at the Technical College on payment of the necessary fees.

(17) Students have to pay for all damage done to the property of the College or to animals sent there.

(18) The library is free to all students. Books cannot be kept longer than four weeks; other libraries in the town are free to students who show their cards.

IV.—EXAMINATIONS.

(19) Fees must be paid when the name is sent in.

V.—STUDENTS' ASSOCIATIONS AND PRIVATE CLUBS.

(20) Before such are started the Director must receive a list of members, the Chairman's name, and time and place of meeting.

VI.—DISCIPLINE.

(30) Those who attack another's honour, or forget the rules of decorum in dispute, or make dishonourable debts, or whose actions injure the repute of the College, or who have a bad influence over others are expelled. If students wish to appeal against this decision, they must do so to the Minister of Agriculture before a week has passed.

VII.—OCCASIONAL STUDENTS.

(32) As occasional students are accepted: (i) German veterinarians; (ii) former students of other veterinary colleges who have not yet passed the final examination; (iii) students at the Hanover Technical School; (iv) veterinarians from other countries or former students of foreign veterinary colleges; (v) other persons who are approved by Professors and Director, and who wish to attend certain lectures. Only veterinarians and former students who have taken the first examination may take part in the instructions given in the clinics.

(33) After the occasional students have given notice of the subjects in which they wish to join and paid the necessary fee they receive an occasional student's ticket.

(34) The fees for occasional students are as follows: For every weekly lecture 5 marks, and at least 15 marks must be paid for the lectures of one half year. For practical work or visits to a clinique, 50 marks. The fees for lectures, practical work, and visits to the clinique would not, however, exceed 100 marks in a term. In addition to this, foreigners must pay an entrance fee of 20 marks.

(35) If the occasional students wish to go in for examinations, all rules relating to the other students apply to them.

Review.

Johne's Disease. By F. W. Twort, M.R.C.S.Eng., L.R.C.P.Lond. (Superintendent of the Brown Institution, University of London), and G. L. Y. Ingram, M.R.C.V.S. (late Veterinary Surgeon to the Institution). Published by Messrs. Ballière, Tindall and Cox, pp. vi + 178, plates 9. Price 6s. net.

In this monograph the authors say they "have attempted to summarize existing knowledge on the subject, and have brought before English readers the investigations of Continental workers. We have also included our own investigations, which have been carried out at the Brown Institution during 1910, 1911, 1912, and the first three months of the current year."

The first five chapters are allocated to the history of the disease, its importance to stockowners and breeders, its clinical features, methods of diagnosis and treatment, and the pathological lesions found *post mortem*. A perusal of the pages of this work cannot fail to impress one with the fact that the authors have succeeded in accomplishing what they set out to do. The subject has been methodically treated, and the matter is in a very palatable form.

The book is exceedingly useful and interesting to those engaged in cattle practice, and will prove instructive and of value to anyone engaged in the investigation or treatment of the disease.

New Instrument.

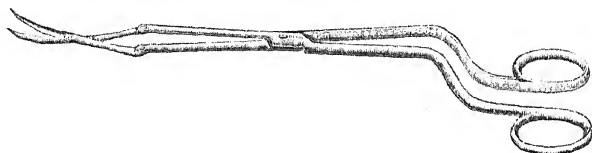
SCISSORS FOR THE VENTRICLE STRIPPING OPERATION FOR ROARING.

By G. H. WOOLDRIDGE, F.R.C.V.S.

Professor in the Royal Veterinary College, London.

In performing the above-named operation for roaring, it is my usual practice, after exposing the interior of the larynx, to make my first incision of the mucous membrane along the outer boundary of the stretched pouch. I next evert the pouch with a burr as recommended by Williams, and which is an advantage over my previous method of eversion by the finger. This leaves the mucous membrane of the sac still attached to the general laryngeal mucous membrane along the free border of the vocal cord, and this I cut with scissors. The ordinary scissors with long blades and long shanks, however, are not the most convenient for the purpose, and I have found the

scissors illustrated here to be much more convenient. They take up so little room through the operation wound, and the hand using them is well out of the way. Moreover, the short curved blades make it almost impossible to injure the vocal cord itself, and much



easier to avoid damaging the *processus vocalis*, which I believe to be the starting point of cartilaginous granulations when they do occur.

The scissors are made by Messrs. Arnold and Sons, West Smithfield, E.C.

Letters and Communications, &c.

Captain Williams; Mr. Motton; Mr. Mitchell; Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Captain Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Captain Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Veterinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

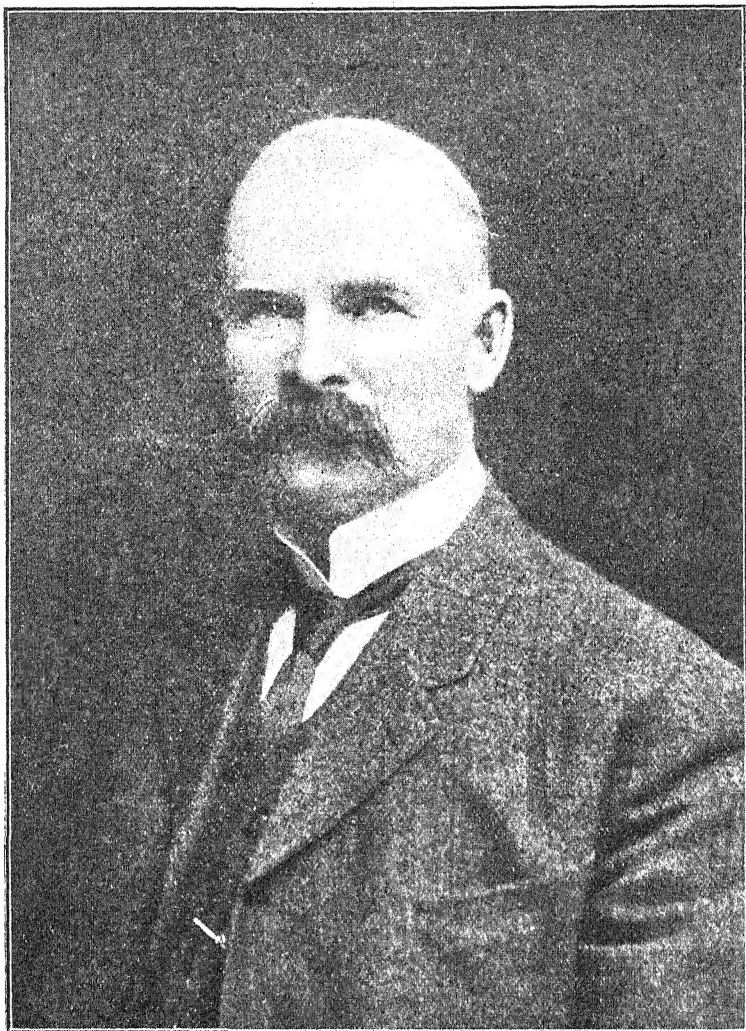
NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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F. Torrance

MR. FREDERICK TORRANCE.

Director-General of the Veterinary Department of the Canadian
Board of Agriculture.

THE VETERINARY JOURNAL

OCTOBER, 1913.

Editorial.

DR. FRED. TORRANCE.

VETERINARY DIRECTOR-GENERAL TO THE CANADIAN GOVERNMENT.

PROBABLY we may be excused for saying that when Dr. J. G. Rutherford resigned the appointment of Veterinary Director-General to the Canadian Government it was thought that there would be great difficulty in filling his place and that it would be a difficult task for anyone to become the successor of such a popular man. It was, therefore, a source of much gratification to the profession that the selection fell upon Dr. Frederick Torrance, as it was felt that there was no one so ably fitted from his professional ability and genial temperament and tact to satisfactorily fulfil the duties of so onerous a position.

Born in Montreal, of Scotch parentage, Dr. Torrance received his scientific training at the McGill University, and graduated as a veterinary surgeon from the Montreal Veterinary College. Starting in practice at Brandon in 1882, he stayed there for a few years, and in 1897 moved to Winnipeg, where he made a very large practice. In 1906, when the Manitoba Agricultural College was opened, he was made Lecturer in Veterinary Science, and in 1908 was elected Professor-in-Charge of that Department. His change of residence to Ottawa has been very much regretted by his colleagues and old students, and it is probably not too much to say that he was the most popular teacher in the College. For some years he has been Secretary of the Manitoba Veterinary Association, and a few years ago was selected as a member of the International Commission elected to investigate Tuberculosis. Only recently he was sent over to England by the Government

to investigate and exchange views with his colleagues here regarding epizootic abortion of cattle, and we hope to see him again next year as one of the Canadian delegates to the International Veterinary Congress. His position as head of the Canadian Veterinary Department is one of great honour and responsibility, and we are quite sure that the safety of the stock of the country is in excellent hands.

TO THE STUDENT ABOUT TO ENTER THE PROFESSION.

THE Colleges are now re-opening, and occasionally during the past few months opinions and letters have appeared in the veterinary and lay press criticizing our present and future position. The present moment is admirably suited for a criticism upon ourselves, and although the horse has diminished in numbers and motor traction has come to stay, there is not only no cause for alarm as to whether a good living is to be earned or not, but there is actually a shortage of qualified men suitable to occupy decently salaried positions (Government and otherwise) which are at the present moment unfilled. What is more, there is every reason to foresee that the opportunities will increase both in value and in numbers, not only in Great Britain, but especially in our Colonies. In countries like South Africa and Australia, where breeding and pastoral pursuits form such an integral part of the life of the country, the health of the animal population is worth looking after in the best possible way, and the best possible way involves the skilled advice of the veterinarian. Those in authority now universally acknowledge this, and as a consequence another outlet has been afforded to those of our graduates whose circumstances or tastes incline in that direction. A comfortably paid position, with regular hours, a divided responsibility, and an assured pension on reaching middle age, is not at all a bad prospect for a young fellow with limited capital to look forward to, and that such appointments are to be obtained, in fact are frequently awaiting suitable applicants, is a well-known fact.

In private practice it is equally a complaint that assistants are almost unobtainable, and even for well-paid positions where one might expect to pick and choose a little, the choice is not there

to be made. Surely this points to the general prosperity of the profession; in fact, those who have watched its career during the past twenty years can honestly say its prospects were never brighter, and to what causes may we legitimately attribute it? The colleges have not the numbers of students which they had twenty years ago, and to that, although perhaps bad for colleges where support depends upon students' fees, may be attributed some measure of the present-day prosperity. It is a compensatory measure to counterbalance the loss of thousands of the equine patients; as, although we have now less patients to treat, it must not be forgotten that there are less graduates to treat them.

Canine practice has come forward by leaps and bounds, for dogs and cats now form a very important portion of the town practitioner's *clientèle*, and as it is the town practitioner who has felt the effect of the arrival of the motor the most it is to canine patients that they look to replace the deficit.

Cattle are still with us, but, more important than all, the country is not flooded with graduates eager to settle down and start practice, so that there is not the opposition nor the fear of opposition such as existed in days gone by; whilst as still further evidence of prosperity it is now becoming quite rare to find a general practitioner who does not own a motor-car.

Take the numbers of students examined during the past six years, as given in the recent Annual Report of the Royal College of Veterinary Surgeons. In 1906 it was 648; in 1908, 531; in 1910, 468; and in 1912, 428, a steady decline and diminution of some 34 per cent. in seven years of the competitors for daily bread with those already graduated. In 1912, 85 men qualified, in 1911 only 72, and about 75 can really be taken as a fair average of the last ten years, whilst the death-rate is approximately the same, or really slightly higher. Thus our numbers do not grow, some classes of our patients have gone, others have developed, but (more important than all) the salaried appointments under Government have increased enormously, and it is to these and to the Army that our young graduates look.

Suppose we take the number 75 as a fair average of the numbers who enter the profession, and do not at all take into consideration the deaths—allow them to be pitted against the loss of patients brought about by motor traction—what do we find left

to enter the competitive ranks of private practice? The Army and the Indian Civil Veterinary Department absorb an average of ten men each year; South Africa, New Zealand and other Colonies take fully fifteen more; ten obtain either Government or municipal appointments in the British Isles; ten at least go to their fathers' practices; five probably have too much money or too little brains and never do anything; and this leaves only twenty men each year to obtain assistants from or to settle down for themselves in general practice. It is not enough, and although at present the shortage is only beginning to be felt, the next ten years will demonstrate it more and more. For those now in the profession the prospects were never brighter, and to those about to join we say that their choice, provided they have a liking and a natural aptitude for their work, is good, and bid them welcome.

General Articles.

BLINDNESS FROM OPTIC NEURITIS, WITHOUT INTRACRANIAL DISEASE, IN A PEDIGREE BULL. OTHER CASES IN MEMBERS OF THE SAME PEDIGREE.*

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[ALTHOUGH cases of amaurosis in all animals are well known in veterinary practice, it is of interest to note the observations of such a well-known ophthalmic specialist as Dr. Nettleship, who, by the way, holds the veterinary diploma as well as that in human medicine.—EDS., *V.J.*]

Case 1.—The case, which was followed to a finish, and upon which opportunity was afforded to make a *post-mortem* examination, was a pedigree Guernsey bull (No. 2,329 in the Herd Book of the English Guernsey Cattle Society), born in November, 1910.

He was perfectly well in all ascertainable respects until he was 11 months old, when, without warning, he became very rapidly and totally blind, and remained so without showing any other symptoms whatever until he was killed, rather more than three

* Abstract from the Royal London Ophthalmic Hospital Reports, vol. xix, Part I.

months after the onset of the blindness, and when between 13 and 14 months of age.

The history in detail is as follows: On Monday, November 6, 1911, when let out of his loose box into a paved yard for exercise as usual, he ran about and behaved in all respects as if perfectly normal, and during that day "went for" his food as usual; two days previously, when his owner, Mr. Boscawen, happened to be passing the yard, the bull had recognized him. Next morning (7th), when the door of the loose box was opened, the animal refused to come forward as usual to be watered, but when he had smelt his way to the bucket he took the water as eagerly as ever; the keeper concluded that the bull was blind. On 9th, Mr. Chetwood-Aiken saw the animal. He found the pupils widely dilated and quite motionless even to the light of a powerful electric torch thrown into the eyes from 2 or 3 in. distance, the loose box being darkened. The animal did not appear in the least conscious of the light, and it was evident from his behaviour that he was quite blind. Only a partial ophthalmoscopic examination was possible, as the bull would not keep still when he had become aware (probably by his sense of smell or hearing) of the presence of a stranger; but although the optic discs were not seen, the retinal vessels that came into view looked normal, *i.e.*, were neither tortuous nor very large; the media were perfectly clear, and the eyes free from congestion or irritation. Nothing more of importance occurred; the bull remained quite well and took his food with appetite when it was brought up to him, but not the slightest recovery of sight took place, and on February 19, 1912 (3½ months after onset), he was killed, by being stunned without perforation of the skull, and then bled. The brain and eyes were removed immediately and placed in a large quantity of 10 per cent. solution of formol; an accidental cut was made in the brain, but this did not interfere seriously with the subsequent examination.

This young bull had not been used, and, indeed, had not come to full sexual maturity. Very full and careful inquiry, in which his owner gave us every possible assistance, quite failed to throw any light upon the cause of the blindness. The animal's diet and habits had been like those of a full-grown bull living in the next loose box, whose sight remained unaffected. The possibility of lead poisoning was gone into in great detail, and no possible source of it could be even suspected. There were no signs of

digestive or intestinal disturbance at any time. The state of the dentition was not recorded.

No similar case had ever been known on the farm, although Mr. Boscawen had been an owner and breeder of these cattle for twenty years.

Although it is certain that this animal had good central vision on November 6 and was blind the next morning, it is, of course, quite possible, and indeed one inclines to say probable, that some loss of the fields of vision had been going on before, and that the final total blindness represented the extinction of the last remaining portion of the fields.

The brain showed no tumour or meningitis, and was macroscopically normal in all parts.

The right eye was divided in sagittal, the left in equatorial, section. On macroscopic section both optic discs were seen to be triangular in outline, with apex upwards, and markedly swollen and opaque, the retinal veins full and the arteries almost invisible. The anterior parts of the eyes appeared in all respects normal.

The central portion of the right eye with the adjoining optic nerve, the separated posterior portion of this nerve, and the left optic nerve were embedded in celloidin for microscopical sections. Sections of the globe were cut in a sagittal, and of the nerves in transverse plane, and, for purposes of comparison, corresponding sections were prepared from a normal bull's eye similarly fixed and embedded. The posterior portion of the left globe was preserved as a museum specimen.

Microscopical Appearances.—Median sagittal sections of the right globe were stained with hæmatoxylin and eosin, and with hæmatoxylin and van Giesen's stain. The optic papilla is markedly swollen, the swelling extending into the neighbouring retina for a distance of 1 mm. above, and 0.5 mm. below, the margins of the scleral opening. The summit of the swelling projects 0.5 mm. above the level of the neighbouring retina. The swelling is determined mainly by an œdematous condition of the tissues of the papilla which has produced a forward projection of its surface, and upward and downward displacement of its margins. In the more peripheral parts of the papilla this œdema has resulted in a vacuolated appearance of the tissues, evidenced by the presence of clear spaces of variable form and size bounded by

a delicate reticulum. In the more central parts the disorganization of the tissues is even more pronounced, the spaces here being more or less completely filled by a granular *débris*, and bounded by an ill-defined and often defective reticulum. The nervous tissue has undergone almost complete disorganization, while the supporting tissue is hypernucleated and very considerably increased in amount.

The cedematous condition met with in the papilla is found also in the retina, but is seen here to involve chiefly the nerve fibres and ganglion cell layers. In the former layer the nerve fibres are degenerated, while the supporting neuroglial tissue is increased in amount. The retinal veins are distended, but neither veins nor arteries exhibit obvious structural changes in their walls; there is, however, some slight leucocytic infiltration of the walls and of the immediately adjacent tissues. In the ganglion cell layer the almost complete disappearance of the ganglion cells is very striking, and is associated with a condition of considerable oedema together with the presence of large spaces which apparently mark the sites of the pre-existing ganglion cells. Occasionally within these spaces remnants of ganglion cells are encountered in the form of shrunken masses of granular protoplasm surrounding a small distorted nucleus. The retinal oedema extends to the inner reticular, and, to a very limited extent, to the outer reticular layer; the nuclear layers are, however, unaffected. The degenerative changes evident in the rods and cones have probably resulted from *post-mortem* change. The choroid, and the anterior parts of the eye, present no obvious abnormality.

The two optic nerves, cut in transverse section, are found to exhibit identical pathological changes. Sections stained by Weigert's myeline sheath method reveal very extensive degeneration of the nerve fibres. This degeneration, although more pronounced in some regions than in others, is, on the one hand, not limited to any definite area of the sections; while, on the other hand, none of the primary nerve fibre bundles is exempt from it. In order to ascertain whether the degenerative changes were more advanced in the anterior or in the posterior portion of the nerve, sections were made of the left optic nerve both immediately behind the globe and at a distance of about 1 in. from it. Comparison shows that there is little difference in the appearance at the two points, the degeneration being, however, if anything,

more pronounced in the posterior (proximal) than in the anterior (distal) part of the nerve. In the Weigert stained specimens, side by side with the nervous degeneration a hypertrophy of the neuroglial supporting tissue is very evident, especially in the periphery of the primary nerve bundles. In sections stained by hæmatoxylin and eosin and by hæmatoxylin and van Giesen's stain the neuroglial cells are more clearly differentiated, many of them having a large cell body and large faintly staining nucleus. The tissues of the pial sheath and of the mesoblastic septa of the nerve show no obvious abnormality in structure or in amount; the small blood-vessels which they support are, however, much more evident than in the normal nerve. The endothelium of these blood-vessels is considerably proliferated, and their walls are thickened and of hyaline appearance. Both in the walls of the blood-vessels and in their immediate neighbourhood there is slight leucocytic infiltration.

Sections through the chiasma stained with hæmatoxylin and van Giesen's stain show proliferation of neuroglial tissue, apparently associated with degeneration of nervous tissue. There is well-marked leucocytic infiltration around all the blood-vessels, but the pial sheath is free from inflammatory infiltration. In sections through the corpora quadrigemina, dentate nucleus of the cerebellum and bulb there is no obvious abnormality.

As to the etiology of the pathological changes in this case, it is impossible to speak in more than general terms. The diffuse distribution of the œdematous and other changes within the globe, and the extensive distribution of the degenerative lesions in the nerve tracts behind the globe, suggest some cause acting in both these situations simultaneously. The changes in the blood-vessel walls of the optic nerves are suggestive of a toxic agent, acting through the blood-stream, and have perhaps some analogy with the changes in these vessels which have been met with in lead poisoning. It seems likely, therefore, that the blindness in this case resulted from some subacute form of poisoning, which had acted in a selective manner on the nervous tissues of the retinae and optic nerves; but what the precise nature of the poisonous substance may have been, and whether self-produced or derived from without, it is impossible now to decide.

The subject of Case 2, France's Sequel, was born in Guernsey on July 22, 1903, and became blind when about 2 years old. It is

thought that the onset of the blindness was gradual, but as the herdman who looked after him has left, and there is no one at Tregothnan who remembers the particulars, we cannot say more. It is said that he suffered a good deal from looseness of the bowels. He had served several cows before he became blind, and continued to be used freely afterwards until he was sold to the butcher, probably at about 3 years of age. He did not recover any sight. Nothing is known of blindness in any of his progeny.

Case 3.—Godolphin Hero 2nd was born in Cornwall, and bought when 6 months old by Mr. J. Jacka, of Trewidden Farm, Penzance. When 12 months old he went “suddenly” blind. Mr. S. J. Motton, veterinary surgeon, of Penzance, saw him on September 11, 1911, almost immediately after the blindness came on, and found “the pupils widely dilated, and both eyes quite insensitive to light, media clear, and nothing wrong made out with the ophthalmoscope; health good, no symptoms of gastric, intestinal or cerebral disorder,” but when loose in his box he went round and round always in the same direction. As a rule was tied up. When at exercise one day appeared to be all right, the next day was blind. Treated with strychnia and iodide without result. Never regained vision. Appetite and health continued good. Was kept for a year, *i.e.*, till he was 2 years old, and became the father of several calves. When about 2 years old he was killed, and the butcher found nothing that he recognized as wrong in any part of the carcase. The progeny of this animal are reported to be doing well, but we have no details.

In respect to food, this bull was brought up by hand with milk for about six months, then some bran, crushed oats and barley and roots; and for a time, whilst being got up for show, had a daily allowance of about 3 lb. of a well-known compound cake,* but was not over-fed. It may be mentioned that he was exhibited at an agricultural show after he had become blind.

Cases 4 and 5, Masher 7th and France’s Masher, may be taken together, as both belonged to the same owner, were nearly of the same age, and went blind at or about the same time. They were born some years before the subjects of any of the other cases.

* This cake is stated to be composed of cotton seed, locust bean, rice, grains, soya bean, rape seed, kapok seed (“silk-cotton,” *Eriodendron anfructuosum*), and molasses. I have heard that cake containing these ingredients has been suspected of being sometimes injurious to stock fed with it, but there appears to be no proof.

Case 4 was born on March 16, 1896, Case 5 in June, 1896; there was thus about three months difference in their ages. Mr. Alfred Le Patourel, of Ramée, Guernsey, who bred and owned these two bulls, writes (August 29, 1912) that so far as he can remember they were fed and treated alike in all respects and not fed on very concentrated food. They were habitually tied side by side in a double stall. Nothing unusual occurred until the bulls were respectively about 11 months and 14 months old, when one morning about the end of April they were both found to be blind. Mr. Le Patourel, writing from memory, states that "we noticed they were both blind the same morning," adding as evidence (1) that they appeared not to see their usual buckets of drink and finally upset them, spilling the contents over the attendant, and (2) that, when being led out of the stable for exercise soon afterwards, they banged against the sides of the stall, apparently because they could not see. Subsequently when tethered out at grass each of them walked round in a circle "making a beaten track at rope's length," and when on several occasions the owner, in order to find out whether they were recovering their sight, placed himself quietly in front of them "they would simply go straight into me and stop short as if unnerved." One of them "in walking round had a peculiar way of drawing out his tongue and working it on both sides of his lower jaw." The veterinary surgeon who was called in asked about the feed and other conditions, but found nothing to criticize, and considered the blindness due to paralysis of the optic nerve.

Mr. J. F. Bullar, of Southampton, was in Guernsey at the time, and made an ophthalmoscopic examination of both these bulls not very many days after the onset of the blindness; and he wrote to E. Nettleship (September 5 and 12, 1912) that he remembered the cases very well both as to the history and as to what he found. His account is that "the man who looked after them thought they were all right at night, but the next morning when he gave them some food in a bucket they could not find it, and knocked it over with their noses." "The eyes appeared" to Mr. Bullar "natural externally." "I examined them," he goes on, "with the ophthalmoscope without any difficulty as they were quite blind and took no notice of the light. There did not seem to me to be any sign of disease in the fundi, but as a bull's

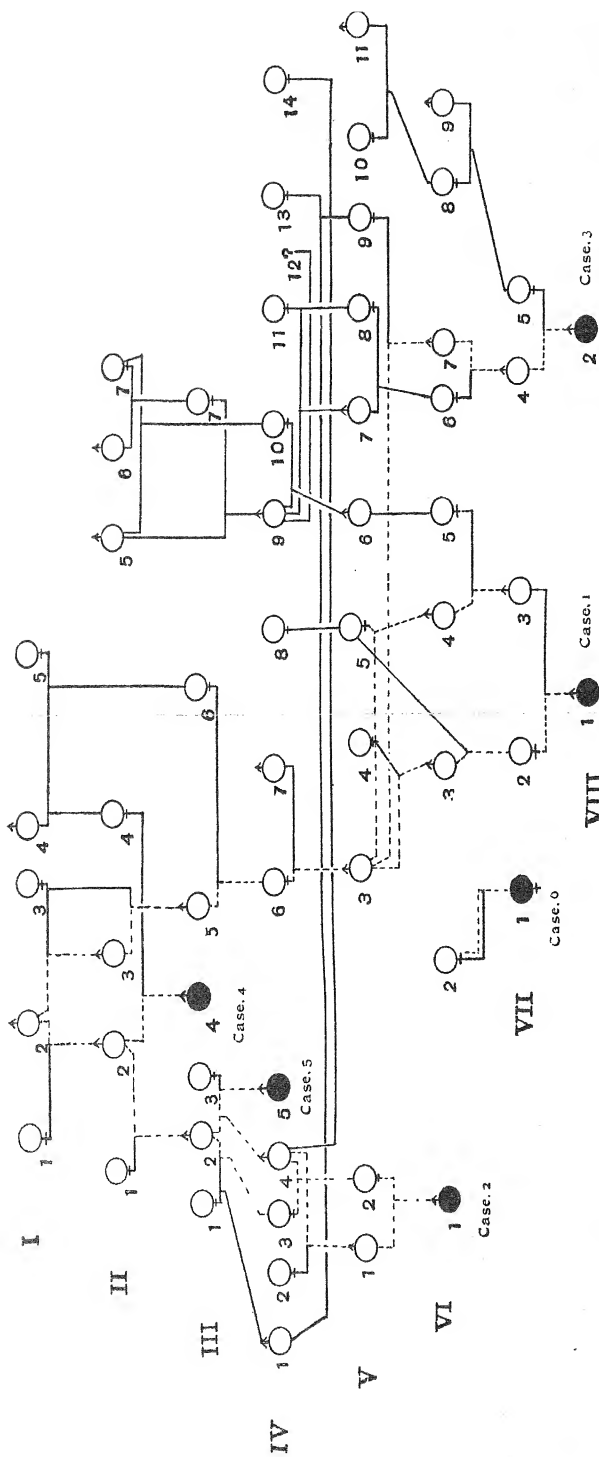
fundus was a novelty to me I asked them to bring a heifer into the shed. She was not a very steady patient, but I got a view of the fundus after a bit, and it was just like the bulls'. I could not find anything to account for the blindness; the bulls had been quite well and had only become rather poor since the blindness, as it seemed to interfere with their grazing." Although Mr. Bullar does not mention the optic discs his examination of the eyes of the bulls and of the control normal heifer was evidently careful and persevering, and we can safely assume that the discs were seen and were practically alike in appearance in all the three animals.

Mr. Le Patourel kept these two bulls for about two months after the blindness came on and then, despairing of their recovery, sold them to the butcher. He tells us he has never seen any other cases like these.

It will be noticed that the mode of onset of the blindness was exactly the same in these two bulls as in Case 1, sight apparently good one evening, quite gone the next morning.

Case 6 was that of a cow calf belonging to Viscount Falmouth, whose steward, Mr. W. Nixon, has kindly given us what information is available. In the spring of 1910, when 6 weeks old or rather more, the calf went blind. The blindness lasted a week or ten days, and the calf then regained her sight, but died a week or two afterwards. The suspicion at the time was that the whole illness had been caused by wrong feeding, and inquiry showed that the man in charge had been in the habit of boiling the "separated" milk on which the calf was fed instead of only raising it to the temperature of new milk. It was suspected that the deaths of some other calves had been caused in the same way. Whether this supposition is correct or not the case evidently differed in its clinical features from the previous one, although occurring in a member of the same pedigree.

Case 7, from notes by Mr. S. J. Motton, of Penzance, is probably quite different in nature from any of the previous ones. This animal is a heifer of the Jersey breed; but both her parents were born in England, the sire at Pangbourne, Berkshire, the dam at Yeovil, Somerset. The calf herself was born near Penzance. Her diet and mode of life differed in no way from that of other animals of her age in the same herd. Early in



DESCRIPTION OF FIGURE.

The broken lines show that the blind individuals (●), Cases 1, 2, 3, 4 and 5, are descended from I, 2.

Case 6 is also known to be descended from I, 2, but the exact connection has not been ascertained.

Index to the Individuals shown on the Pedigree, Fig. 1.

P. = Pedigree stock.

F. = Farm stock.

- Generation I, 1, No. 1091 F. of Herd Book*; 2, Rydale† 475 P.; 3, 1629 P.; 4, 537 P.; 5, 1639 F.
 Generation II, 1, 1923 P.; 2, Masher, 703 P.; 3, Rydale† 475 P.; 4, 2058 P.; 5, 885 P.; 6, 663 Rydale† 475 P.; 7, 1876 F.
 Generation III, 1, 1005 P.; 2, 3739 P.; 3, France 6th, 4620 P.; 4, France's Masher, 1010 P.; 5, Case 5, France's Masher, 1010 P.; 6, Richesse du Chene 8th, 4004 P.; 7, 1076 P.; 8, 2277 F.; 9, 088 P.; 10, 3891 P.; 11, 3892 P.; 12, No. 13, 3206 P.; 14, 3778.
 Generation IV, 1, Masher's Sequel, 1266 P.; 2, France 11th, 4621 P.; 3, Governor of the Chene, 1297 P.; 4, 2069 F.; 5, 2260 F.; 6, 1170 F.; 7, 1264 F.; 8, 174 F.; 9, 5501 P.; 10, 4813 P.; 11, 1569.
 Generation V, 1, Case 2, France's Sequel, 1651 P.; 2, Mrs. Grindy, 3897 P.; 3, Majesty of Lila Cottage, 1902 P.; 4, Conqueror and, 320 F.; 5, 2306 F.; 6, 5828 F.; 7, Golden Hero of L'Etienné, 1507 P.; 8, 6666 F.; 9, 6667 F.; 10, 6668 F.; 11, 6669 F.; 12, 6670 F.; 13, 6671 F.; 14, 6672 F.; 15, 6673 F.; 16, 6674 F.; 17, 6675 F.; 18, 6676 F.; 19, 6677 F.; 20, 6678 F.; 21, 6679 F.; 22, 6680 F.; 23, 6681 F.; 24, 6682 F.; 25, 6683 F.; 26, 6684 F.; 27, 6685 F.; 28, 6686 F.; 29, 6687 F.; 30, 6688 F.; 31, 6689 F.; 32, 6690 F.; 33, 6691 F.; 34, 6692 F.; 35, 6693 F.; 36, 6694 F.; 37, 6695 F.; 38, 6696 F.; 39, 6697 F.; 40, 6698 F.; 41, 6699 F.; 42, 6700 F.; 43, 6701 F.; 44, 6702 F.; 45, 6703 F.; 46, 6704 F.; 47, 6705 F.; 48, 6706 F.; 49, 6707 F.; 50, 6708 F.; 51, 6709 F.; 52, 6710 F.; 53, 6711 F.; 54, 6712 F.; 55, 6713 F.; 56, 6714 F.; 57, 6715 F.; 58, 6716 F.; 59, 6717 F.; 60, 6718 F.; 61, 6719 F.; 62, 6720 F.; 63, 6721 F.; 64, 6722 F.; 65, 6723 F.; 66, 6724 F.; 67, 6725 F.; 68, 6726 F.; 69, 6727 F.; 70, 6728 F.; 71, 6729 F.; 72, 6730 F.; 73, 6731 F.; 74, 6732 F.; 75, 6733 F.; 76, 6734 F.; 77, 6735 F.; 78, 6736 F.; 79, 6737 F.; 80, 6738 F.; 81, 6739 F.; 82, 6740 F.; 83, 6741 F.; 84, 6742 F.; 85, 6743 F.; 86, 6744 F.; 87, 6745 F.; 88, 6746 F.; 89, 6747 F.; 90, 6748 F.; 91, 6749 F.; 92, 6750 F.; 93, 6751 F.; 94, 6752 F.; 95, 6753 F.; 96, 6754 F.; 97, 6755 F.; 98, 6756 F.; 99, 6757 F.; 100, 6758 F.; 101, 6759 F.; 102, 6760 F.; 103, 6761 F.; 104, 6762 F.; 105, 6763 F.; 106, 6764 F.; 107, 6765 F.; 108, 6766 F.; 109, 6767 F.; 110, 6768 F.; 111, 6769 F.; 112, 6770 F.; 113, 6771 F.; 114, 6772 F.; 115, 6773 F.; 116, 6774 F.; 117, 6775 F.; 118, 6776 F.; 119, 6777 F.; 120, 6778 F.; 121, 6779 F.; 122, 6780 F.; 123, 6781 F.; 124, 6782 F.; 125, 6783 F.; 126, 6784 F.; 127, 6785 F.; 128, 6786 F.; 129, 6787 F.; 130, 6788 F.; 131, 6789 F.; 132, 6790 F.; 133, 6791 F.; 134, 6792 F.; 135, 6793 F.; 136, 6794 F.; 137, 6795 F.; 138, 6796 F.; 139, 6797 F.; 140, 6798 F.; 141, 6799 F.; 142, 6800 F.; 143, 6801 F.; 144, 6802 F.; 145, 6803 F.; 146, 6804 F.; 147, 6805 F.; 148, 6806 F.; 149, 6807 F.; 150, 6808 F.; 151, 6809 F.; 152, 6810 F.; 153, 6811 F.; 154, 6812 F.; 155, 6813 F.; 156, 6814 F.; 157, 6815 F.; 158, 6816 F.; 159, 6817 F.; 160, 6818 F.; 161, 6819 F.; 162, 6820 F.; 163, 6821 F.; 164, 6822 F.; 165, 6823 F.; 166, 6824 F.; 167, 6825 F.; 168, 6826 F.; 169, 6827 F.; 170, 6828 F.; 171, 6829 F.; 172, 6830 F.; 173, 6831 F.; 174, 6832 F.; 175, 6833 F.; 176, 6834 F.; 177, 6835 F.; 178, 6836 F.; 179, 6837 F.; 180, 6838 F.; 181, 6839 F.; 182, 6840 F.; 183, 6841 F.; 184, 6842 F.; 185, 6843 F.; 186, 6844 F.; 187, 6845 F.; 188, 6846 F.; 189, 6847 F.; 190, 6848 F.; 191, 6849 F.; 192, 6850 F.; 193, 6851 F.; 194, 6852 F.; 195, 6853 F.; 196, 6854 F.; 197, 6855 F.; 198, 6856 F.; 199, 6857 F.; 200, 6858 F.; 201, 6859 F.; 202, 6860 F.; 203, 6861 F.; 204, 6862 F.; 205, 6863 F.; 206, 6864 F.; 207, 6865 F.; 208, 6866 F.; 209, 6867 F.; 210, 6868 F.; 211, 6869 F.; 212, 6870 F.; 213, 6871 F.; 214, 6872 F.; 215, 6873 F.; 216, 6874 F.; 217, 6875 F.; 218, 6876 F.; 219, 6877 F.; 220, 6878 F.; 221, 6879 F.; 222, 6880 F.; 223, 6881 F.; 224, 6882 F.; 225, 6883 F.; 226, 6884 F.; 227, 6885 F.; 228, 6886 F.; 229, 6887 F.; 230, 6888 F.; 231, 6889 F.; 232, 6890 F.; 233, 6891 F.; 234, 6892 F.; 235, 6893 F.; 236, 6894 F.; 237, 6895 F.; 238, 6896 F.; 239, 6897 F.; 240, 6898 F.; 241, 6899 F.; 242, 6900 F.; 243, 6901 F.; 244, 6902 F.; 245, 6903 F.; 246, 6904 F.; 247, 6905 F.; 248, 6906 F.; 249, 6907 F.; 250, 6908 F.; 251, 6909 F.; 252, 6910 F.; 253, 6911 F.; 254, 6912 F.; 255, 6913 F.; 256, 6914 F.; 257, 6915 F.; 258, 6916 F.; 259, 6917 F.; 260, 6918 F.; 261, 6919 F.; 262, 6920 F.; 263, 6921 F.; 264, 6922 F.; 265, 6923 F.; 266, 6924 F.; 267, 6925 F.; 268, 6926 F.; 269, 6927 F.; 270, 6928 F.; 271, 6929 F.; 272, 6930 F.; 273, 6931 F.; 274, 6932 F.; 275, 6933 F.; 276, 6934 F.; 277, 6935 F.; 278, 6936 F.; 279, 6937 F.; 280, 6938 F.; 281, 6939 F.; 282, 6940 F.; 283, 6941 F.; 284, 6942 F.; 285, 6943 F.; 286, 6944 F.; 287, 6945 F.; 288, 6946 F.; 289, 6947 F.; 290, 6948 F.; 291, 6949 F.; 292, 6950 F.; 293, 6951 F.; 294, 6952 F.; 295, 6953 F.; 296, 6954 F.; 297, 6955 F.; 298, 6956 F.; 299, 6957 F.; 300, 6958 F.; 301, 6959 F.; 302, 6960 F.; 303, 6961 F.; 304, 6962 F.; 305, 6963 F.; 306, 6964 F.; 307, 6965 F.; 308, 6966 F.; 309, 6967 F.; 310, 6968 F.; 311, 6969 F.; 312, 6970 F.; 313, 6971 F.; 314, 6972 F.; 315, 6973 F.; 316, 6974 F.; 317, 6975 F.; 318, 6976 F.; 319, 6977 F.; 320, 6978 F.; 321, 6979 F.; 322, 6980 F.; 323, 6981 F.; 324, 6982 F.; 325, 6983 F.; 326, 6984 F.; 327, 6985 F.; 328, 6986 F.; 329, 6987 F.; 330, 6988 F.; 331, 6989 F.; 332, 6990 F.; 333, 6991 F.; 334, 6992 F.; 335, 6993 F.; 336, 6994 F.; 337, 6995 F.; 338, 6996 F.; 339, 6997 F.; 340, 6998 F.; 341, 6999 F.; 342, 7000 F.; 343, 7001 F.; 344, 7002 F.; 345, 7003 F.; 346, 7004 F.; 347, 7005 F.; 348, 7006 F.; 349, 7007 F.; 350, 7008 F.; 351, 7009 F.; 352, 7010 F.; 353, 7011 F.; 354, 7012 F.; 355, 7013 F.; 356, 7014 F.; 357, 7015 F.; 358, 7016 F.; 359, 7017 F.; 360, 7018 F.; 361, 7019 F.; 362, 7020 F.; 363, 7021 F.; 364, 7022 F.; 365, 7023 F.; 366, 7024 F.; 367, 7025 F.; 368, 7026 F.; 369, 7027 F.; 370, 7028 F.; 371, 7029 F.; 372, 7030 F.; 373, 7031 F.; 374, 7032 F.; 375, 7033 F.; 376, 7034 F.; 377, 7035 F.; 378, 7036 F.; 379, 7037 F.; 380, 7038 F.; 381, 7039 F.; 382, 7040 F.; 383, 7041 F.; 384, 7042 F.; 385, 7043 F.; 386, 7044 F.; 387, 7045 F.; 388, 7046 F.; 389, 7047 F.; 390, 7048 F.; 391, 7049 F.; 392, 7050 F.; 393, 7051 F.; 394, 7052 F.; 395, 7053 F.; 396, 7054 F.; 397, 7055 F.; 398, 7056 F.; 399, 7057 F.; 400, 7058 F.; 401, 7059 F.; 402, 7060 F.; 403, 7061 F.; 404, 7062 F.; 405, 7063 F.; 406, 7064 F.; 407, 7065 F.; 408, 7066 F.; 409, 7067 F.; 410, 7068 F.; 411, 7069 F.; 412, 7070 F.; 413, 7071 F.; 414, 7072 F.; 415, 7073 F.; 416, 7074 F.; 417, 7075 F.; 418, 7076 F.; 419, 7077 F.; 420, 7078 F.; 421, 7079 F.; 422, 7080 F.; 423, 7081 F.; 424, 7082 F.; 425, 7083 F.; 426, 7084 F.; 427, 7085 F.; 428, 7086 F.; 429, 7087 F.; 430, 7088 F.; 431, 7089 F.; 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936, 7594 F.; 937, 7595

The calf was born in July, 1912, at full time and after a natural labour. He showed no deformity, defect, or peculiarity, and had the normal black and white coat-colour of the breed. Fed from birth onwards with milk from a pail, the milk not necessarily, or not all, coming from the mother; no artificial foods used; mother at pasture both before and after the calf was born. The calf was never out of its loose box. It is believed on account of its behaviour that the calf was blind of both eyes from the first, and that he remained so until he was killed for veal at 12 weeks of age. He thrived well, had no loss of power in limbs, nor any peculiarities of behaviour or movement, and seemed to make up for lack of sight by hearing and smell. Used to knock up against things, and at first did not run after the food-bucket as calves do when fed, but soon learnt to be as sharp as others, apparently by the aid of hearing. All who saw or had to do with the calf judged him to be quite blind, although the eyes looked, to lay observers, quite normal. No veterinary advice appears to have been asked, and Dr. Souter unfortunately did not hear of the case until after the animal had been killed.

This animal was its mother's second calf; she was $3\frac{1}{2}$ years old in August, 1912. Her first was a heifer calf born in August, 1911, and quite normal. Both were by the same father, who was, like the dam, about $3\frac{1}{2}$ years old in August, 1912.

The five pedigree cases, 1, 2, 3, 4, and 5, were bulls, and in four of them the blindness came on at practically the same age, within a month or two of one year; in all five it was permanent; in none were there any other symptoms referable to the nervous system, unless the tendency to walk round and round in a circle, or the habit of making some peculiar motion with the tongue, mentioned in some of them, is to be regarded as such; none of them showed any signs of illness, and in none was there anything suspect in the diet, with the possible exception of a particular cake that was given to Case 3. Two of them had progeny after the blindness came on. The singular fact that in Cases 4 and 5, belonging to the same owner, the blindness came on at the same time to a day, if we can accept the history, seems to point strongly to a poison of some kind associated with the dietary, though, of course, not necessarily present as such in the food when eaten. The fact that all the five bulls were related to each other more or less closely by blood, as is shown

in the Pedigree Chart, naturally arouses the suspicion that the disease of the optic nerves, from which we believe that all these five bulls suffered, was the result of an hereditary disposition analogous to the well-known family optic neuritis of the young adult human male. But we do not as yet know enough about the natural history of this bovine blindness to venture upon any such conclusion.

[The authors then give some further twenty pages of cases of amaurosis from various causes, mainly collected from veterinary periodicals, the complete details of which can be obtained, if required, from the Royal London Ophthalmic Hospital Reports.]

A NEW CYLICOSTOME WORM FROM THE HORSE IN LONDON.

By R. T. LEIPER, D.Sc., M.B., F.Z.S.

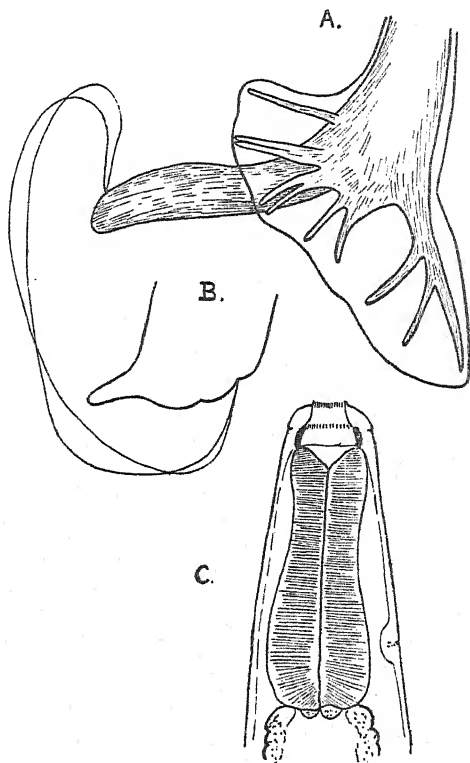
Wandsworth Research Scholar and Helminthologist at the London School of Tropical Medicine.

IN 1910 I published in the *Proceedings of the Zoological Society* a list of the nematodes which occurred in the intestines of a number of horses slaughtered in London. The list included the following bursate nematodes: *Strongylus equinus*, *S. edentatus*, *S. vulgaris*, *Triodontophorus serratus*, *Gyalocephalus capitatus* and *Cylichnostomum elongatum*, and a new form recorded as *Cylichnostomum*, sp. nov.

Later, Mettam published a paper on certain cylichnostomes in Irish horses in the *Veterinary News*. Through the courtesy of Professor Mettam I had an opportunity of examining the material which comprised the species *C. nassatum* and *C. calicatum*. It is interesting that the cylichnostome, taken as the *C. tetracanthum*, Mehlis, by Looss in his "Monograph on the Sclerostomidæ of Horses and Donkeys in Egypt," has not yet come under my notice, nor had it been specifically determined as occurring in the British Isles. Annett, in his paper on "Sclerostomiasis in Equines," in the *Proceedings of the National Veterinary Association* for 1911, gives Looss' list of sclerostomes in Egypt, and states that "with the help of his descriptions and illustrations I have encountered no serious difficulties in iden-

tifying the many thousands of equine sclerostomes which I have collected, fixed, cleared and mounted during the last few years; in fact, but very little guidance has sufficed to enable one of my lady laboratory assistants to successfully differentiate the worms in my collection."

Nevertheless, no list of the species actually found is given, and it would appear that the work of identification did not pro-



A, B, the male genitals. C, the oesophagus.

ceed beyond that of the three genera in which these forms are contained, and which, it may be added, can readily be distinguished by the naked eye. In my own collections in London there occurred, as stated above, a species which I mentioned, but did not describe, as *Cylichnostomum*, sp. nov. The original material consisted solely of a pair of worms in copula. Camera lucida drawings were made at the time, and it was intended that

a full description should appear later along with the result of further investigations into the forms which actually occur in England. Owing to the great increase of motor traffic, I have had since few opportunities of collecting in London, and as the species presented certain striking peculiarities, it seems advisable to publish the original drawings with a brief description in the hope that those more fortunately situated and interested in the subject of intestinal parasites may assist in obtaining further information about the worm and its progeny.

The worms, male and female, are fairly large and stout as compared with the other species in the genus, ranging, in my recollection, about 12 mm. to 14 mm. in length. The mouth collar is separated by a slight constriction, the circumoral papillæ are not specially well defined. The chitinous mouth capsule has a depth in proportion to its transverse diameter as 2:5. The cesophagus is short and thick (fig. c). The excretory pore lies on a level with the greatest diameter of the cesophagus. The most striking features of the new species occur, however, in the male genitalia (figs. A, B). The spicules are very long and hair-like. The genital cone in the male is enormously developed, extending from beneath the bursal membrane, which is itself abnormally enlarged ventrally, in consequence of which the usually tiny prebursal papillæ are very stoutly developed and resemble the ventral pair. In the female the posterior extremity is tilted dorsally and ends in a blunt and well-defined stump. Immediately in front of the anus lies the vaginal orifice, into which, in the original specimens, the spicules of the male were inserted (fig. B).

In acknowledgment of the very kind manner in which Professor Mettam has from time to time placed material at my disposal, I name the new form *Cylicostoma* (vel *Cylichnostomum*) *mettami*, sp. nov.

THE PROPOSED "VETERINARY SURGEONS ACT" OF
NEW SOUTH WALES.

By T. G. PALGRAVE, M.R.C.V.S.

Auckland, New Zealand.

ON reading a copy of the above Act which has come into my possession I find that the proposed Veterinary Surgeons' Board "may refuse to register as a veterinary surgeon or may remove from the register any person who has ceased to possess or does not possess the qualifications in respect of which he was registered." This naturally gives rise to two questions: (1) How could any applicant be registered in New South Wales or elsewhere if he did not possess the qualifications in virtue of which he claimed registration, except by gross carelessness on the part of the body which granted him registration? (2) How can any person who has once possessed the qualifications required for registration cease to possess them?

Even if the possessor of a veterinary degree has been struck off the register he still possesses his diploma or degree, and also, presumably, the knowledge which enabled him to obtain it. I also find that the above-mentioned Board "may refuse to register as a veterinary surgeon or may remove from the register any person who has been guilty of infamous conduct in any professional respect." That the Board should have the power to remove from the register the name of any person guilty of "infamous conduct, &c.," is only right, though it would have been better had "infamous conduct" been defined. As the Act stands there is no indication of what constitutes "infamous conduct," so that the phrase may mean anything or nothing.

It is somewhat difficult to understand how any applicant for registration as a member of the profession can be refused registration on account of "infamous conduct in any professional respect."

Until he is registered he will not be a member of the profession, and therefore cannot be "guilty of infamous conduct in any professional respect," prior to registration; this being so, it would appear that, as the Act stands, he can be refused registration for a "professional" offence which—not being at the time a member of the profession—he could not commit. Can it be true that "the Law is a hass"?

Clinical Articles.

EMACIATION AND DEATH ASSOCIATED WITH NECROSIS AND ABSCESS FORMATION IN THE SPLEEN OF A HORSE.

By LIONEL B. BULL, B.V.Sc.

*First Assistant, Government Laboratory of Pathology and Bacteriology,
South Australia.*

RECENTLY portion of a spleen taken from a horse at a *post-mortem* examination was forwarded to me for microscopic examination by the Chief Inspector of Stock in this State, South Australia.

Previous to death the animal had shown a gradual wasting. As far as one can ascertain this lasted about two months, when the animal died. No other symptoms apart from the gradual emaciation and debility showed themselves. Mr. Loxton, G.M.V.C., Chief Veterinary Officer, was called to make a *post-mortem* examination.

Post-mortem examination revealed nothing but a very large spleen approximately four to five times the normal size. No other organ in the abdominal cavity showed any abnormality, and the contents of the thorax were normal. The spleen was larger and denser than normal. On section it was seen to be mottled throughout, and contained towards one end two large abscess cavities. The mottled appearance was due to the presence of irregular greyish necrotic areas, some of which showed a tendency towards breaking down and pus formation. These areas extended throughout the organ to the capsule, which was apparently thickened.

Portion of the spleen was placed in 10 per cent. formalin solution, and forwarded to the laboratory for examination.

Microscopically it is seen that there is considerable destruction of the spleen parenchyma. Under the low power of the microscope the capsule is seen to be extremely thickened; it is approximately 2 mm. in thickness. This thickening is mainly due to the development of new fibrous tissue. The muscle cells of the capsule are more or less completely degenerated. There is much oedema, and there are smaller and larger, more or less irregular spaces consisting entirely of fibrinous material with a few poly-

morphs in the meshwork. Here and there are to be seen larger or smaller irregular areas which take the basic stain deeply at their periphery, but in the centre are more or less degenerated (fig. 1). Under a higher power these areas are seen to be composed of masses of a filamentous Gram-negative bacillus (fig. 2). These organisms are granular or beaded in appearance (stained with carbol-thionin or Giemsa), and are morphologically identical with *Bacillus necrophorus* (Schmorl). In some instances chains of streptococci are seen to be associated with the bacilli. The lower margin of the capsule is marked by the presence of a thin band of plain muscle fibres.

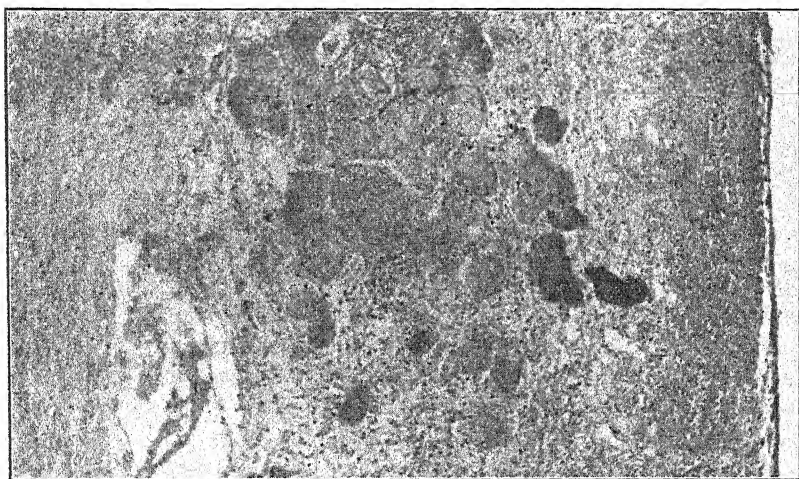


FIG. 1.—Showing thickened capsule of the organ, with cedematous spaces and large irregular masses of micro-organisms more or less degenerated. $\times 92$.

Beneath the capsule are large areas containing leucocytes. These are the remains of the spleen parenchyma, but no Malpighian corpuscles are to be seen. These areas consist mainly of polymorphs and lymphocytes. They show some cedema and degeneration. In many of them are to be seen large irregular masses of bacilli, the cells in the vicinity of the invasion being more or less degenerated (fig. 3). There is much necrotic and cedematous material around these areas of leucocytes, and the trabeculæ of the gland are for the most part necrosed, the whole histological structure of the organ being confused.

Undoubtedly, the condition present in the organ is due to an

invasion of a Gram-negative bacillus with a slight secondary invasion of a streptococcus. Unfortunately, the bacillus could not be examined culturally as the tissue was preserved in formalin before being received. The resemblance between the bacillus present and *B. necrophorus* is so striking that one concludes that they are one and the same organs. Moreover, the character of the lesion present suggests the presence of the "necrosis bacillus." In the absence of cultural examination it cannot be definitely stated that the organism is *B. necrophorus* (Schmorl), but one is inclined to believe that it is.

The case is in many respects a remarkable one. There was

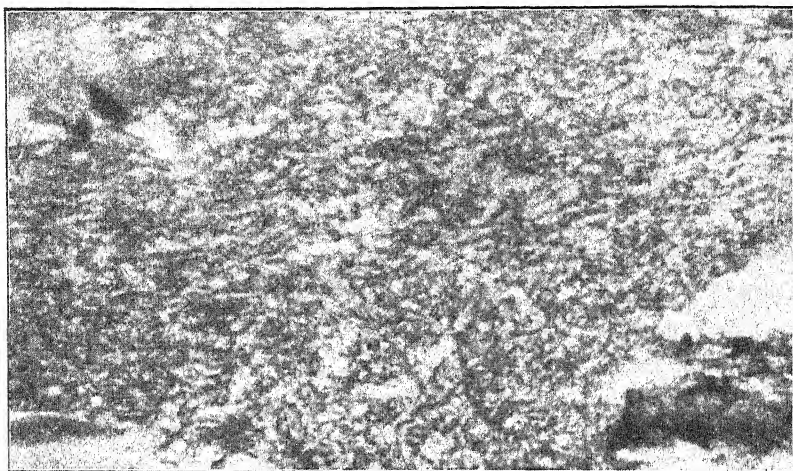


FIG. 2.—Showing a mass of filamentous Gram-negative bacillus resembling *B. necrophorus*. $\times 900$.

no history of a wound through which the infection might have taken place. There were no other lesions present in either the organs of the abdominal or thoracic cavities. One is led to believe that infection has taken place through the mucous membrane lining the alimentary canal, as *B. necrophorus* lives a saprophytic existence in the canal. As far as one knows there was no lesion in the mucosa of the intestines of stomach, but possibly it may have been present and so small as to be overlooked. Evidently the spleen has caught up the infection from the blood-stream, and the organism there has produced the lesion described. Possibly the organism in these cases does not produce a local

lesion in the alimentary canal, for I have seen necrotic patches in the livers of deer and bovines due to the "necrosis bacillus" when the intestinal coats were perfectly normal in appearance. Necrotic patches in the liver and abscess formation in the lungs due to *B. necrophorus* are not uncommon, but I have not seen recorded the fact of this organism causing a lesion in the spleen.

We are learning more about the ubiquity of this organism, and the numerous lesions it is associated with in the lower animal. I record this case so that veterinarians, if they happen to meet with a similar one, may investigate the cause more thoroughly and confirm the microscopical findings by cultural examination.

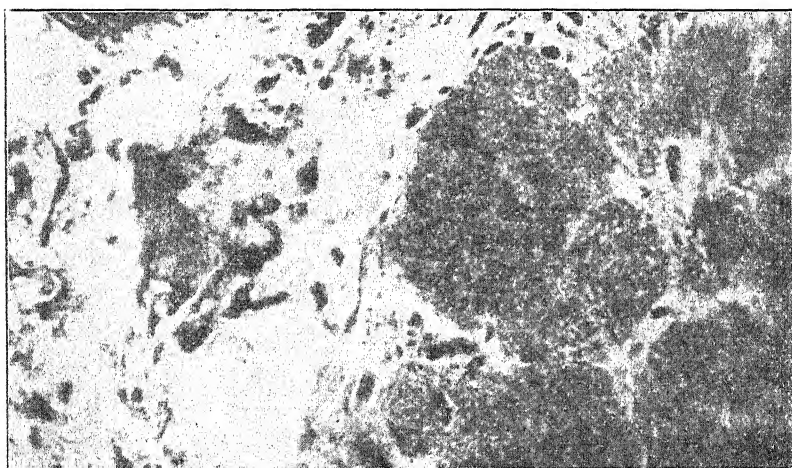


FIG. 3.—Showing an irregular mass of the micro-organisms in relation to the tissue elements which are more or less degenerated. $\times 700$.

Since writing the above Mr. Wakeham, M.R.C.V.S., brought me portion of a spleen removed at *post-mortem* examination on a horse which had died from acute peritonitis following on rupture of a splenic abscess.

The spleen was enormously enlarged, and resembled very much in appearance the spleen above described. Apart from the abscess cavities there was an extension of the infection through the organ, giving to the parts affected a mottled appearance resembling somewhat that seen in the previous case. The necrosis was not so extensive as in the previous case, and there

was much greater tendency to breaking down and pus formation.

Culturally one was not able to demonstrate the presence of *B. necrophorus*. Martin's broth inoculated with the pus and kept both under ærobic and anærobic conditions showed in twenty-four hours only streptococci. Later other organisms grew, but *B. necrophorus* was not to be found. Microscopical examination of sections of the diseased tissue also failed to reveal the presence of bacilli resembling *B. necrophorus*.

One must regard this case as being simply a pyogenic infection of a streptococcus. That the infection should be primary in the spleen is unusual and worthy of note, for it rendered early diagnosis extremely difficult.

RUPTURE OF THE DIAPHRAGM.

BY CHIEF VETERINARY SURGEON DRECKERT.

THE riding-horse "Orest" was struck under the body whilst jumping a hurdle. Two hours later I was called to him and found the following picture. The patient was bathed with sweat, sunken head, advanced and outstretched fore-limbs, and great distress in breathing; visible mucous membranes intensely reddened; pulse 66 per minute, powerful, even and regular; heart beats clear; temperature, 38·3 C.; respirations, 53; extremely laboured and of pure abdominal type; nostrils dilated to the full extent and at every respiration a quivering of the whole body. On closer examination I found as a cause of this quivering a contraction of the loin and abdominal muscles synchronous with inspiration. In the upper third and anterior portion of the lungs there was pronounced vesicular breathing. In the lower third of the field of auscultation, bounded anteriorly by the sixth and posteriorly by the eighth rib, there were intestinal murmurs and muscular murmurs with the previously described quiverings. Percussion in this region gave a tympanitic sound. Nothing abnormal could be detected with abdominal and pelvic organs. Dung and urine were voided. From these symptoms I diagnosed rupture of the diaphragm and entrance of a portion of intestine into the thoracic cavity.

In treatment I came to the conclusion to try and keep the

patient quiet, so that no greater segment of bowel should enter into the thorax. Further, the frequency of the breathing must be lessened and incarceration and inflammation of the intestine avoided. Intestinal activity must be limited, and finally the portion of intestine removed from the thorax.

Morphine hydrochlorate was injected subcutaneously and 50 c.c. of tincture of opium simplex given daily in bran tea. Rough and corn food were excluded and the animal only given bran tea to drink.

The quiverings disappeared in eight hours. For the first six days the patient breathed twenty-three to thirty times per minute. On the third day percussion and auscultation showed that the loop of intestine had gone back into the abdominal cavity. The patient was ridden after four weeks. This record seems to justify the assumption that symptomatic treatment warded off the customary unfavourable sequel of rupture of the diaphragm and the horse was rendered serviceable.—*Zeitschrift für Veterinärkunde*.

ON THE TREATMENT OF INDURATIONS AND THICKENINGS OF THE SKIN AND SUBCUTIS IN THE LIMBS OF HORSES.

BY STAFF VETERINARY SURGEON MICHAELIS.

INDURATIONS and thickenings of the lower parts of the limbs occur with great frequency in our troop horses. They arise, as a rule, from traumatic injuries to the skin or even periosteum from blows given by other horses or by kicking fixed objects. In other cases they consist of the residues of blood or lymph extravasations, or they remain after phlegmonous inflammation of the skin or subcutaneous tissue. The lameness, as a rule, disappears after the acute symptoms subside, so that the usefulness of the horse does not appreciably suffer or, at any rate, only for a short time. On the contrary, the appearance of the animal is considerably influenced by these indurations. Many horses are much disfigured and decline in market value. The veterinary surgeon is often asked how to remedy these disfigurements and defects.

I have given up bathing, massage, Pressnitz poultices, cam-

phor-spirit bandaging, fibrolysin injections and blistering, and now use iosorp-lanoline ointment. The iosorptol, according to the sensitiveness of the skin, is used in concentration of 1:10 up to equal parts of lanoline. The indurated and swollen parts of the skin are massaged daily from ten to fifteen minutes and then covered with woollen bandages. For complete success, however, it is absolutely necessary that the operation be carried out for some time, on an average for a period of four to eight weeks. In this way I have removed a whole series of fresh and old thickenings of the integument.

Two bad cases, one in an officer's horse in which the limb at the fetlock joint of a hind leg was almost double the circumference of its fellow, was cured after eight weeks' treatment and no difference in the limbs could be detected. A second horse, with a badly swollen pastern, was cured after six weeks' treatment.

Massage with the remedy should not be too violent, but the ointment rubbed in with light pressure, which may be strengthened according to the hardness of the thickening and sensitiveness of the skin.—*Zeitschrift für Veterinärkunde.*

INFLUENZA AMONGST REMOUNTS AND ITS TREATMENT WITH SALVARSAN.

BY STAFF VETERINARY SURGEON JÄGER.

OUT of 252 remounts, seventy-one fell ill with influenza. The course of the disease was insidious and the outbreak a rather severe one. Pleurisy and pneumonia were common and great heart weakness occurred in a few patients. Six remounts suffered from tendonitis as a sequel, two from paralysis of the pharynx, two from internal inflammation of the eyes, one from purpura, obstinate skin disease and paralysis of the sphincter ani muscles. In seven remounts roaring remained as a sequel.

Salvarsan, prepared at the military veterinary academy, was used in the treatment. Three grammes of salvarsan dissolved in 0.9 per cent. salt solution was infused into the jugular vein. One dose was sufficient. Quivering of muscles of the head and body, laboured breathing, motor disturbance, and a quick, weak pulse

are results of the injection. A marked drop in the temperature is observed. Salvarsan did not check the duration of the illness or stop the origin of infection.

Summarizing, it may be said:—

(1) Salvarsan causes a quick decline of fever and a shortening of the whole fever period.

(2) A slow favourable influence on the activity of the heart.

(3) A limiting and retarding of the pneumonia.

(4) Good effect on appetite and general condition—loss of weight seldom occurred.

(5) Shortening of convalescence.

(6) No checking or avoidance of dreaded subsequent effects—tendonitis, roaring, &c.

(7) Scarcely a checking or stoppage of the origin of illness.

(8) Scarcely any shortening of the duration of the illness.

—*Zeitschrift für Veterinärkunde.*

AN IMPROVISED CHLOROFORM INHALER.

By C. E. HILL, M.R.C.V.S.

Darlington.

As the subject of anæsthetization of the horse in the standing position has recently been brought to the front again, perhaps the following will be of interest. In May last year I was called to attend a cart mare with complete prolapse of the uterus after foaling. It had been everted for about three hours, and the mare was now standing quietly in a stall. Not having a chloroform inhaler with me, I borrowed a small pillow case and fixed it with the aid of tapes on the animal's head. I then put about 2 oz. of chloroform on some cotton-wool and slipped it into the bottom of the pillow case under the nostrils. After about ten minutes she began to get dazed and to rock about unsteadily, her muscles relaxed, and I readily replaced the uterus, keeping it in position with a West's clamp. The animal made an excellent and complete recovery.

PARALYSIS OF THE INTERNAL POPLITEAL NERVE
IN CATTLE.

By R. H. SMYTHE, M.R.C.V.S.

Redruth.

THIS is a condition which we have frequently met with in dairy cows, associated with but more frequently subsequent to parturition. The animals more commonly affected are those of the rich milking breeds, which carry little flesh. Jerseys and Guernseys are particularly liable to be affected.

The symptoms may appear during parturition, but usually from immediately afterwards to within a week after calving, and frequently occur as a sequel to milk-fever cases which have remained on the ground for several days. The cow appears unable to rise. If it be possible to get her on her feet the left hind limb will be the one affected.

After an extensive experience of this condition, which appears to be fairly common in the West of England, where the majority of cattle are of the best dairy type, we have never observed paralysis of the right limb, and the number of cases met with excludes the possibility of coincidence.

While standing, the animal can place little or no weight on the limb, and the digits are constantly held in a state of plantar flexion. The hock cannot be extended, but with each forward step it is over-extended, so that the foot is jerked upwards and forwards with the digits flexed backwards, and the anterior surface of the fetlock finally comes to the ground. In these early stages there is evidence of pain in the limb arising from deficient circulation.

In about 75 per cent. of cases recovery occurs naturally in a few days, and it is possible that thrombosis plays a considerable part in the early stages.

In other cases the animal lies constantly for from one to several weeks, and on rising at last shows exactly the same symptoms as above, excepting that there is now marked atrophy of the muscles at the back of the thigh, and later from constant knuckling over, the supernumerary digits at the back of the fetlock become driven into the fleshy portion of the heel and cause serious injuries. This appears to cause no pain, as sensation below the hock is very deficient. The animal loses flesh rapidly,

the milk diminishes, and after a protracted course the animal usually dies.

Treatment, such as blistering and setons over the course of the sciatic and popliteal nerves, is of no avail.

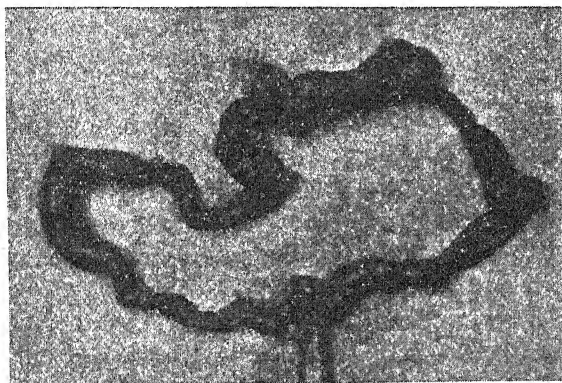
The cause is obscure and may be pressure on nerves during parturition, or more probably deficient blood supply to the nerve from embolism.

A CASE OF INTUSSUSCEPTION IN A BULLOCK.

By W. D. LINDSAY, M.R.C.V.S.

Broadway.

THE subject was a yearling Shorthorn bullock in a thriving condition. The owner told me he had noticed the beast on the previous day to be dull and disinclined to eat. There was slight tympany of the rumen. I passed the probang and a fair amount of gas came away. A smart laxative was administered, followed by



A case of intussusception in a bullock.

draughts of ammon. carb. On the following day there was no practical result. The laxative had failed to act and the tympany was more pronounced than on the previous day. Refused all kinds of food and would not look at water. Probang again passed and another laxative given, but the following day brought no relief and the beast was certainly worse. I now began

to suspect that it had picked up some foreign substance. The animal was kept alive for three more days and then slaughtered. During the whole time it was never seen to lie down, was not restless in any way, and showed only a very slight inclination to strain.

Post-mortem examination showed an intussusception of the bowel 11 in. in length. The photograph shows the outer portion of the bowel split open and laid back so as to expose the intensely congested inner portion.

A disappointing case, but a most interesting *post-mortem*.

PARASITIC CYST IN THE BRAIN OF A HEIFER.

By H. A. REID, F.R.C.V.S., D.V.H.

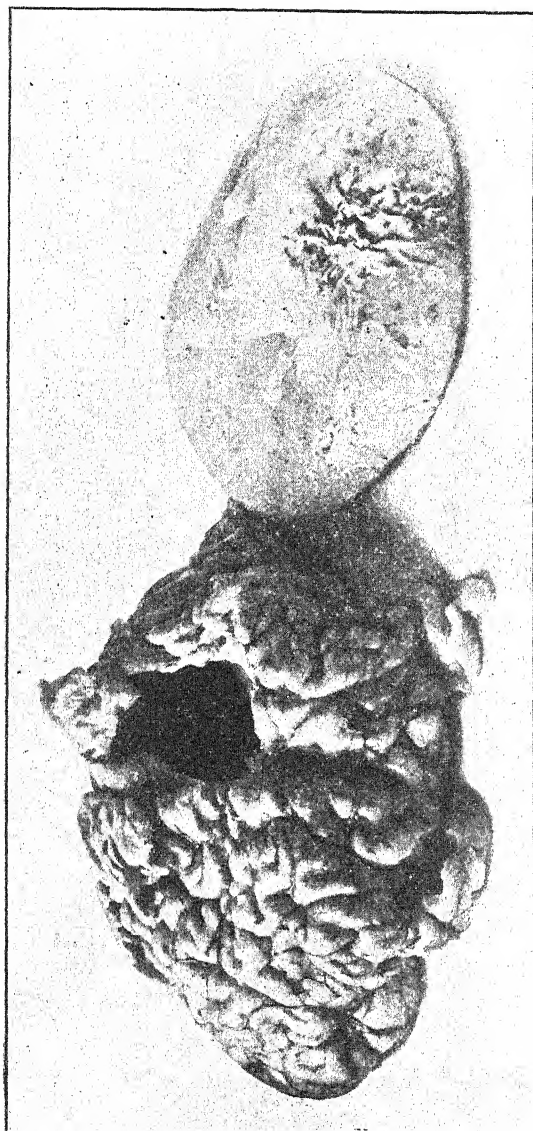
Veterinary Laboratory, Wallaceville, New Zealand.

THE accompanying illustration depicts the result of the development of a *cœnurus* cyst in the brain of a three-year-old heifer. About six months ago the animal was noticed to present certain abnormal symptoms consisting of more or less erratic movements and tendency to incline the head to one side. These symptoms were not pronounced and a general examination failed to reveal any definite cause.

Later on characteristic movements became more marked. The heifer walked in circles from left to right, the eyesight appeared to be defective, and in consequence of not being able to obtain its feed readily considerable loss of condition took place. Further examination proved that the animal was practically blind, although no structural alteration in the eyes could be observed. There was never any bulging or softening of the cranial bones, nor any pain evinced on pressure over this region.

The case was diagnosed as one of brain pressure involving the optic tracts, probably resulting from cystic growth.

Post-mortem examination showed congestion of the meningeal blood-vessels, and determined the presence of a hydatid cyst occupying the lateral ventricle of the right cerebral hemisphere, extending into the fore brain. The cyst wall was composed of greyish-white fibrous tissue, studded with yellow, granular material. The cyst, with its fluid contents, was about the size of a goose egg.



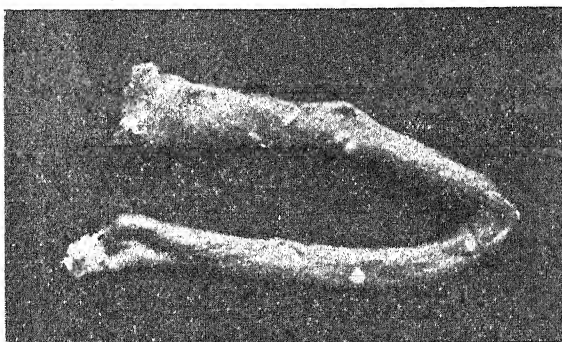
Photograph showing the brain and the cyst removed.

SARCOSPORIDIA OF THE ŒSOPHAGUS OF A SHEEP.

By W. D. LINDSAY, M.R.C.V.S.

Broadway.

I HAVE no history of this case. She was a ewe killed for sale for food. White "spots" were noticed on the gullet, which



Sarcosporidia of the œsophagus of a sheep.

was given to me to look at as a curiosity. What became of the carcass or whether any other part was affected I do not know. I did not have the opportunity to examine it.

SOME CASES OF TETANUS IN THE PIG.

By JOHN B. YOUNG, F.R.C.V.S.

Braintree, Essex.

SIXTEEN pigs, about 9 weeks old, very fine specimens and in exceptionally clean styes, were castrated in the usual way. After about a week the owner reported one dead and some of the others stiff. I found five very stiff and suffering obviously from tetanus, all of which died. The others were quite all right and in the best of health. Out of the six which died two were males and four females. The operation wounds in the affected and the healthy were quite normal.

Feline Clinicals.

WASP STING.

By T. G. PALGRAVE, M.R.C.V.S.

Auckland, N.Z.

ON May 8 a large female tabby cat, about 9 months old, was brought to me by the owner with the history that about twenty minutes previously the cat had been playing in the garden while the owner was putting in some flowers, and when playing had been stung by a wasp.

The owner told me that immediately on being stung the cat behaved as though in a fit, rushing about wildly, running round in a narrow circle, mewing, and finally collapsing. From the time the cat was stung to the time she collapsed in a heap on the ground was about three minutes (as nearly as the owner could judge); previous to this occurrence the cat had always been perfectly healthy.

When brought to me the cat was breathing hurriedly and irregularly, the pulse was rapid and almost imperceptible, the pupils of the eyes greatly dilated, the left being more dilated than the right, there were occasional muscular twitchings of the trunk and limbs, and the cat was evidently in considerable pain, and cried pitifully but faintly. I was unable to find any marked swelling, but as the creature's coat was very long and thick that was not surprising. In order to allay the pain, I gave the cat 4 gr. of Merck's chloral hydrate in a little milk, which she took without giving any trouble, and ten minutes later followed up the chloral by 10 minims of aromatic spirit of ammonia well diluted with water, and with a little pulv. tragacanth. co. added; this was also taken without any trouble, and the cat was left with me for further observation.

During the next twenty minutes or so the cat appeared much better, walked about the room, taking stock of the contents, came and rubbed herself against me, and finally lay down in front of the fire, and within an hour of receiving the chloral was quietly asleep.

She slept for about an hour or a little more and then got up, and as soon as she was upon her feet exhibited a fresh set of symptoms.

Pain was apparently absent; breathing slow and deep; great weakness of the hind quarters; partial loss of control over the muscles of the hind limbs; coldness of the body and limbs; pupils of the eyes far less dilated than when she was first brought to me, and both pupils now dilated to an equal extent; pulse full and regular, numbering sixty-five beats per minute; temperature 99.8° F.

In spite of the want of control over the hind limbs she staggered about the room, clawed her way up on to my knee, and lay there, occasionally purring faintly.

She was given an inhalation of the medicinal liquor ammoniæ, the nose being first smeared with a little vaseline; then a drachm of French brandy. Within a few minutes she appeared more lively, licked the vaseline off her nose, and drank a little warm milk, after doing which she settled down again in front of the fire and dozed for an hour or so. She continued to doze for intervals varying from approximately an hour to two hours, waking up to wander about and come up to be nursed until 11 p.m., when she was left for the night, first receiving 2 drachms of castor oil. The waking intervals lasted approximately from half to one hour each, and during these intervals she occasionally took a little milk.

The next morning she was much better, though still very weak in the hind quarters, and the oil had acted well. During the day she improved steadily without further treatment, and was returned to her owner that evening. She has remained perfectly well ever since (June 1, 1913), *i.e.*, for three weeks.

The features of the case which interested me and made me think it worth recording were the symptoms which appeared when the cat woke up from the first sleep, which sleep was induced by the chloral.

They were not the symptoms caused by bee or wasp sting which she showed when first brought to me; neither were they the symptoms caused by an overdose of chloral, which are staggering, dilatation of the pupils, relaxation of all the muscles, and deep stupor, sometimes preceded by a stage of exaltation; nor were they the symptoms of a toxic dose of ammonia, which, as a general rule, are hurried pulse and respirations, salivation, cough, swollen tongue, dysphagia, and marked distress. Possibly the wasp venom had a markedly depressant effect on certain nerve centres; at any rate, I assumed such to be the case when I gave the brandy.

SUPERNUMERARY DIGITS IN A CAT.

By F. C. MINETT, B.Sc., M.R.C.V.S.

Royal Veterinary College, London.

THE subject of this note was a dark tabby, male (castrated) cat, aged about 8 months.

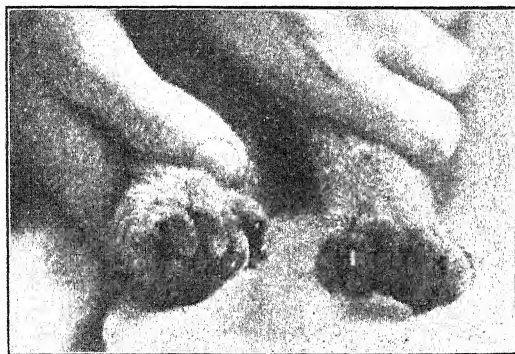
As supernumerary digits with this distribution in the cat are by no means of common occurrence,* and this being an exceedingly well-marked case, I had the two accompanying photographs taken. From these it will be observed (and more especially from examination of the photographs of the right fore and right hind feet) that two extra digits were developed on each foot to the inner side of the four main digits. In the case of the fore feet

[* The presence of one supernumerary digit on each foot in the cat is not very uncommon in our experience. The chief interest in Mr. Minett's case, however, is the presence of two extra digits in each fore foot, a condition which is certainly rare.—Eds., *V. J.*]

the supernumerary digits were therefore situated between the four main digits and the small normally present internal digit. In the hind feet the development of each extra digit about equalled that of the largest main digit. In the case of the fore feet the innermost extra digit was developed to about the same



Fore feet, each showing two supernumerary digits.



Hind feet, showing one supernumerary digit.

extent as the largest main digit, the outermost extra digit being only about half this size.

Unfortunately, I was unable to ascertain from the owner of the cat any very exact details with regard to the other kittens in the same litter. The probability seems to be that these had no extra digits. The mother of the cat now in question, however, certainly had, at any rate, one extra digit on each foot.

A DISEASE OF POULTRY.

By R. H. SMYTHE, M.R.C.V.S.

Redruth.

AN outbreak of a disease presenting some rather curious features broke out on a small poultry farm near Redruth.

At the commencement of the attack the owner, who considered the disease to be roup, destroyed a number of affected birds in the hope of abating the infection. However, the disease spread and a number of young chickens died, and at the time of my inspection several valuable brood hens were affected. The birds were penned in confined runs and were sadly in need of green stuff.

Symptoms.—The disease appeared as an epizootic and a number were affected simultaneously. The symptoms were loss of appetite, coughing, and a depressed appearance. The comb shrivelled and the bird could be picked up without resistance.

The lesions were confined to the oral mucous membrane. At either side of the lining of the lower half of the beak, adjacent to the edges of the tongue, appeared raised, creamy yellow ulcers, oval in shape, of about the size of a grain of wheat. These did not become confluent. The hard palate and the nasal cavities, the larynx and trachea, showed no lesions, neither were there any symptoms of catarrh. Diphtheritic membranes were never visible.

Microscopical Lesions.—Microscopically the ulcers appeared to be composed of massed together globular bodies without visible nucleus or definite formation, having somewhat the appearance of fat cells and which were probably degenerated and swollen epithelial cells. In addition to these there were present in the lesions several distinct organisms, the frequency with which they occurred being in the following order. Preparations were stained with gentian-violet.

(i) Rod-shaped single bacilli, 4 microns by 1·5 microns, much resembling anthrax bacilli.

(ii) Groups of various cocci.

(iii) Very characteristic spirillæ, about 4 to 5 microns in length, in which the body exhibited two complete spiral turns.

(iv) Oval bacteria, 3 microns in length, occurring in chains of three and four, with a very thick capsule. The contents stained deeply.

(v) An occasional very small oval psorosperm.

It is probable that the causal organisms were the spirillæ or oval bacilli, or both. The others were probably secondary or accidental bacilli. Psorosperms are frequently present in the digestive canal of birds.

Treatment Adopted.—The ulcers were removed together with portions of the oral mucous membrane by means of curved scissors. The parts were then freely dressed with tinct. iodi. Pot. permang. was added to the drinking water and the healthy birds removed to other pens.

Recovery occurred in cases treated early by this means.

Parliamentary.

[COPY.]

A BILL TO AMEND THE LAW RELATING TO THE SLAUGHTERING OF ANIMALS FOR HUMAN FOOD.*

BE IT ENACTED by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons in this present Parliament assembled, and by the authority of the same, as follows:—

PART I.

The Humane Slaughtering of Animals.

I.—(1) After the commencement of this Act no animal (as hereinafter defined), any portion of which is intended to be used as human food, shall in any public or private slaughter-house or elsewhere be slaughtered except in accordance with the following regulations:—

- (a) Every animal shall be stunned or otherwise rendered insensible before blood is drawn.
 - (b) No method or instrument shall be used for the purpose of stunning, rendering insensible, or slaughtering any animal except such methods and instruments as shall be approved by the Local Government Board.
 - (c) No animal shall be slaughtered in the sight of any other animal, and no carcase, portion, blood, or refuse of any slaughtered animal shall be deposited within sight or smell of any other animal awaiting slaughter.
- (2) Any person who contravenes or fails to comply with or causes or permits any contravention or non-compliance with any of the above regulations shall be liable on summary conviction to a penalty not exceeding five pounds for a first offence, or in the case of a second or subsequent conviction to a fine not exceeding twenty pounds.

II.—(1) After the commencement of this Act no animal (as hereinafter defined), any portion of which is intended for human food, shall in any district be slaughtered or stunned or otherwise rendered insensible preparatory to slaughter, except by the holder of a licence granted by the Local Authority of such district.

(2) Such licences shall be personal and permissive only and not indicative of proficiency, and shall be granted only to such persons as the Local Authority shall think fit, being male persons of the age of eighteen years or upwards.

(3) Every such licence shall be effective only in the district of the Local Authority granting the same, and shall be valid for

* To be brought forward in Parliament by Mr. Arthur Lee, M.P., at the request of the "Council of Justice to Animals."

twelve months only from the date thereof, and may be renewed from time to time at the discretion of the Local Authority.

(4) Any such licence may upon conviction of the holder of any offence under this Act be cancelled by the order of the Court before whom such holder shall be convicted.

(5) A fee, not exceeding five shillings, may be charged by the Local Authority for each such licence and a fee not exceeding one shilling for each renewal. Such fees shall form part of the funds of the Local Authority, out of which the expenses of or incidental to this Act shall be payable.

(6) Any person who shall slaughter or attempt to slaughter any animal in contravention of this Section shall be liable on summary conviction to a fine not exceeding five pounds for each offence.

III.—The Local Government Board shall from time to time, by Order, approve such methods and instruments for the purposes mentioned in Regulation (b) in Section 1 of this Act as they shall consider best calculated to secure the humane slaughter of animals with as little suffering as possible, and may from time to time, by Order, make such further regulations in addition to and not being inconsistent with the regulations specified in Section 1 of this Act as shall, in their judgment, be desirable to secure the more humane slaughtering of animals for human food, and from and after the date specified in any such Order this Act shall have effect in the same manner in all respects as if such further regulations had been enacted by Clause 1 of this Act.

IV.—Any inspector of nuisances or medical officer of health of a Local Authority and every other officer or person appointed or authorized by a Local Authority shall have the right to enter any private slaughter-house in the district of such Local Authority at any hour by day or at any hour when business is or appears to be in progress, or is usually carried on therein, for the purpose of examining whether there is or has been any contravention of or non-compliance with the provisions of this Act, and if any person shall refuse to permit any such inspector of nuisances, medical officer of health, or other officer or person as aforesaid to enter any premises which he is entitled to enter under this Act, or shall obstruct or impede him in the exercise of his rights under this Act, he shall be liable on summary conviction to a penalty not exceeding £5 for each offence.

PART II.

Closing Private Slaughter-houses.

V.—At any time after the commencement of this Act any Local Authority may

(a) Acquire by agreement any private slaughter-house within the district of such Local Authority, and the interest or interests of any owner, lessee, or occupier thereof.

(b) Agree with the owner, lessee, or occupier of any private slaughter-house for the disuse thereof as a

slaughter-house on such terms and conditions as may be arranged between the parties.

VI.—If in any district a public slaughter-house has, either before or after the commencement of this Act, been provided,

- (1) The Local Authority may at any time after the commencement of this Act publish by advertisement in a local newspaper circulating in the district a notice to the effect that the use of private slaughter-houses in the district, or in any part of the district specified in such notice, is to be discontinued after the expiration of such period (not being less than six calendar months after the date of publication of such advertisement) as may be specified in such notice.
- (2) The Local Authority shall pay compensation to the owner, lessee, or occupier of every private slaughter-house in their district who may be injuriously affected by the exercise of the powers given by the last preceding sub-section.
- (3) After the expiration of the period specified in such notice any person who shall in such district or in such specified part thereof, as the case may be, slaughter or cause to be slaughtered any animal any part of which is intended for human food elsewhere than in a public slaughter-house shall be liable on summary conviction to a penalty not exceeding £50.

VII.—The amount of any compensation payable under Section 6 of this Act shall in case of dispute be ascertained in the manner provided by the Public Health Acts, and Local Authorities may borrow money for the purposes of Clauses 5 and 6 of this Act in any manner in which they may borrow money for the purpose of erecting public slaughter-houses.

PART III.

Miscellaneous.

VIII.—The expenses incurred or payable by a Local Authority under this Act shall be provided as follows:—

In the case of a Borough, out of the Borough Fund or Borough Rate.

In the case of an Urban District not being a Borough, out of the District Fund or general District Rate.

In the case of a Rural District, as general expenses incurred in the execution of the Public Health Act, 1875.

In the case of the City of London, out of such funds applicable to the like purposes as the Local Authority shall think fit.

In the case of the County of London, out of any funds applicable for general County purposes.

IX.—Any penalty under this Act shall, if a Local Authority be the informer, go to such Local Authority, and all penalties recovered by a Local Authority shall be paid over to their Treasurer, and shall by him be carried to the account of the fund

applicable by such Local Authority to the general purposes of this Act.

X.—For the purposes of this Act,

(1) The word "animal" shall include any bull, cow, ox, heifer, steer, calf, ram, ewe, wether, sheep, lamb, pig, horse, mule, or ass.

(2) The areas named or described in the first column of the following table shall respectively be "districts," and the authorities named or described in the second column of the same table shall be the Local Authorities thereof respectively.

Boroughs	The Council of the Borough.
Urban Districts other than	
Boroughs	The District Council.
Rural Districts	The District Council.
The City of London ...	The Mayor, Aldermen, and Commons of the City of London in common council assembled.

The County of London ... The County Council of London.

XI.—This Act shall not apply to Scotland or Ireland.

XII.—This Act shall come into operation on the first day of January, 1914.

XIII.—This Act may be cited as "The Humane Slaughtering of Animals Act, 1913."

Abstract.

TREATMENT OF HÆMOGLOBINÆMIA OF THE HORSE BY INFILTRATION OF AIR UNDER THE SKIN.

BRUNSWIG, a veterinary surgeon of Soissons, has had good results in the treatment of hæmoglobinæmia of the horse by pumping air into the subcutaneous tissue. He recorded his cases in the *Journal de Médecine Vétérinaire*, and Paris, a veterinary surgeon at Haye-du-Puits, confirms the good results by recording a case of his own in *Recueil de Médecine Vétérinaire*. The treatment consists in injecting air where the skin is loose, as at the neck, shoulder and chest, by means of a strong needle and an apparatus similar to that used in udder injections. An extensive subcutaneous emphysema is thus produced. Brunswig passes the air over a mixture of turpentine, creosote, iodoform æther, thymol and camphor, and afterwards through wool. Treatment is simple and quite without danger. Brunswig has treated four patients thus and all were cured. Paris had success in a very bad case by the same procedure.—*Zeitschrift für Veterinärkunde*.

Reviews.

Practical Bacteriology; Microbiology and Serum Therapy (Medical and Veterinary). A Text-book for Laboratory Use. By Dr. A. Besson, formerly Director of the Bacteriological Laboratories of the Military Hospitals of France. Translated and adapted from the Fifth French Edition by H. J. Hutchens, D.S.O., M.A., M.R.C.S., L.R.C.P., D.P.H. (Oxford), Heath Professor of Comparative Pathology and Bacteriology of the University of Durham. Pp. 892 + xxx. Illustrations 416, of which 149 are coloured. Published by Longmans, Green and Co., London. Price 36s. net.

The object of this work is indicated by the author in the preface to the first French edition, in which he says it "has been designed purely as a laboratory guide—a book which would both direct the beginner step by step, and at the same time afford to the more skilled worker such assistance as would enable him to pursue his researches in a profitable direction." The fifth edition appeared in 1911, so the translator obviously found it necessary to bring the matter up-to-date in the course of this work. He has also altered the arrangement to a slight extent while retaining the main features of the original work.

On the whole the author and translator have accomplished their object to an excellent degree. The work is divided into seven parts (there are only three in the original). Part I concerns itself with general technique, and deals with sterilization; culture media; incubators; methods of isolation and cultivation of organisms; the theory and use of the microscope (a very excellent chapter); methods of staining (a very good chapter for reference); experimental inoculations and *post-mortem* examinations; the collection and examination of materials: and a chapter on immunity, including sections on serums, antitoxins, agglutinins, opsonins, &c. Part II is devoted to the pathogenic bacteria. Part III to the parasitic fungi. Part IV to the pathogenic spirochæte. Part V deals with the protozoan parasites, of such rapidly increasing importance, and Part VI considers the filtrable viruses. Part VII is quite a short one, and deals with the application of bacterial methods to the examination of water, sewage, and air.

From the veterinary standpoint there are several very serious omissions, for we are unable to find any reference to such all-important organisms as the bacillus of contagious abortion, the bacillus of chronic bacterial enteritis of cattle (Johne's disease), the *Bacillus necrophorus* and the *Botriomyces equi* (or *Discoomyces equi*). With reference to distemper of the dog, no mention is made of Ferry's excellent work or of the bacillus described by him as *B. bronchisepticus canis*, which appears to play so important a rôle in distemper.

We are not convinced of the advisability of the substitution,

by the translator, of the generic names of *Discomyces* for *Streptothrix*. We have already noted that the terms *Botriomyces* and *Discomyces* are used synonymously, and as there is absolutely no relationship between *Botriomyces* and *Streptothrix* further confusion is likely to follow.

With reference to the question of handling animals more might have been said with advantage. We cannot imagine that a medical student would get much assistance from the following: "Bovine animals are, as a rule, easily managed. For long operations the animal is thrown on a vaccination inoculation table or placed in Vinsol's apparatus." Then, as to muzzling dogs, it is very improbable that any veterinary surgeon accustomed to handling dogs would muzzle him by passing "a piece of stout string into the animal's mouth behind the canine teeth, making a simple knot below the jaw, and then tying in a double knot on the nose." For taking blood from a dog for examination, no mention is made of the posterior auricular vein, certainly the most convenient situation for the purpose when only small quantities are needed.

The book as a whole is written in a very lucid manner, and cannot fail to be extremely useful as a laboratory guide both for students and others engaged in research.

A Text-book on Disease-producing Micro-organisms, especially intended for the Use of Veterinary Students and Practitioners. By Maximilian Herzog, M.D., Professor of Pathology and Bacteriology in the Veterinary College and to the German Hospital at Chicago. Pp. 644, with 214 illustrations and 14 coloured plates. Published by Baillière, Tindall and Cox. Price 21s. net.

This review should have appeared some time ago, the fault being that of the reviewer, who unfortunately mislaid the book. Further, he offers the author his apologies as the work is one which fills a distinct gap in veterinary literature, particularly as it is written in such a concise manner and so excellently illustrated that it is a text-book which the man in daily practice, who is some years removed from college days, can readily appreciate and understand. Especially is it likely to be of use just now to the English practitioner when called upon to administer the clauses of the new Tuberculosis Order of the Board of Agriculture, for both this disease and Johne's disease of cattle are fully dealt with. Anthrax, black quarter, glanders, strangles, actinomycosis, tetanus, malignant oedema, contagious abortion, canine typhoid, and all the everyday specific diseases are fully brought up to date, in most cases illustrated with splendidly executed photographs or colour plates; whilst others less commonly met in this country, such, for example, as epizootic lymphangitis, psittacosis of the parrot and other bird diseases, cattle plague, pneumonia of cattle, &c., are fully described.

A section of the book deals with public health work and is written to be of service to the inspector of food-stuffs, dealing with the bacteria of meat poisoning and the bacteriological

examination of milk, also with the human and bovine diseases transmissible through milk.

Part IV is set aside for the pathogenic protozoon, and includes the trypanosomes and piroplasms, also illustrated; whilst at the end of each chapter is a series of questions arranged for the benefit of students. In this Professor Hertzog has made a new departure, and one which may with advantage be followed by other writers, especially those who happen to be teachers.

The publishers have done their part well, the book being of convenient size, and the paper and print of the best.

As a text-book every student should get it, and as a work of reference no practitioner should be without it on his bookshelf.

The Eleventh Annual Report of the Imperial Cancer Research Fund (1912-1913).

It seems almost incredible that eleven years have passed since the establishment of the Imperial Cancer Research Fund, and the amount of work done in endeavouring to discover a cure for this terrible disease has been enormous—unluckily, up to the present, without the desired end being attained. Much knowledge has, however, been gained upon the subject of the malignancy and transmissibility of tumours, and the question of heredity in cancer cases has also received especial attention.

Quoting from the Report, the following paragraphs will give the clinician much food for thought:—

“The work of the year has been mainly directed to the marshalling of facts proved experimentally to be constant, and to the observation of the varying results obtained from prolonged propagation of strains of cancerous growth originally obtained from different spontaneous tumours.

“The statistical investigations as to the occurrence of cancer in India, our Colonies and Dependencies, and among uncivilized races, have been continued and are of great interest and value. It is gratifying to find that investigations carried out by the German Colonial Office confirm the results we had arrived at. The German Report states that ‘it is certain that no new growth occurs in Germany which is not also found in the natives of the Tropics, and no new growth occurs in the Tropics which is not found in Germany.’

“During the year there has been more than the usual number of requests for information as to the existence of ‘cancer-houses’ or as to districts in which the occurrence of cancer was above the average. Investigation showed that in each case which could be satisfactorily examined, the age and sex of the population appeared to be the determining factor rather than local or climatic conditions.

“As in former years, various claims of possessing a cure for cancer were brought to the Fund’s notice. Where any information which could be relied on was available, these claims were investigated, and were, I regret to say, not borne out by the evidence obtained.

"The breeding experiments to try and solve the question of heredity in cancer have been continued and the numbers have now reached so large a figure, that it is permissible to compare the two strains of mice. The total number of female mice bred was 800; of these 476 were descended from mice whose mother and one or both grandmothers were cancerous, and 324 from mice whose mother and both grandmothers were non-cancerous. Of the 476 of recent cancerous ancestry 98 or 20.58 per cent. developed cancer; while of the 324 of remote or non-cancerous ancestry 38 or 11.69 per cent. developed cancer. Only female mice were taken into account in this enumeration, for it is in them that spontaneous cancer most frequently occurs.

"The observation and study of the constancy and variability of the cells and histological structure in propagated cancer-tumours, together with researches into the acquisition and loss of immunity under certain circumstances, has been the principal work of the scientific staff during the year.

"It has been found that tumours apparently sarcomatous in character, occurring in the rabbit and guinea-pig, can be successfully propagated only in their own species, and are incapable of immunizing other kinds of animals against the inoculation of tumours.

"Further evidence has been obtained that the resistance to growth induced by the inoculation of normal or of tumour-tissue is identical in nature. In both, the maximum resistance is reached in about ten days, and is gradually lost, normal susceptibility to inoculation being regained in eighty days. Attention was first called in 1906 to the part played by the simultaneous absorption of tumour-tissue in hindering its own growth. After six or seven years of the observation and study of thirty-six strains of distinct primary origin, it became possible to divide these strains into groups, each having specific types of growth, and to select from them strains exhibiting the characteristic features of the group in the highest degree. The differences in these groups appear to be dependent on differences in the original tumours, and not on the soil in which they have been grown, in all cases normal mice having been made use of. Thus tumour strain '206' after five years of transplantation still takes and grows rapidly in every case, but all the tumours cure themselves and eventually disappear; while on the other hand strain '47' after seven years' propagation grows slowly in a small proportion of the mice experimented on, and the tumours disappear in the majority of them, but not in all cases. Strain '199' grows rapidly in more than one-half of the inoculations, but a high proportion of the tumours disappear. Tumour strains '68' and '50,' which formerly behaved in a somewhat similar manner, now grow in every animal inoculated and do not disappear.

"Propagated tumours which only exhibit transitory growth when inoculated into normal animals present exactly the same features as do normal tissue-cells; both agree in producing resistance to the growth of grafts of themselves inoculated subsequently, whilst normal or tumour-tissue taken from another

animal when inoculated produces resistance both to its own growth and to the development of grafted tumour-tissue. Experiments have shown that some strains of propagated tumours grow progressively, whilst other strains have a tendency to disappear, and it is found that inoculation with tumour-tissue from strains in which the growth is progressive confers less powers of resistance to subsequent inoculation with other tumour-tissue than does inoculation with tumour-tissue taken from strains of propagated tumours which have a tendency to disappear. The power of inducing resistance to the development of tumour-tissue appears, therefore, to be due to some property inherent in the tumour itself and not dependent on other causes."

The Journal of the Board of Agriculture, September, 1913.—The *Journal of the Board of Agriculture* for September contains a number of articles on various subjects of interest to farmers, one in particular being devoted to the question of tuberculosis in farm stock. This article gives, briefly, a *résumé* of the up-to-date knowledge on the subject of tuberculosis in popular language and indicates the lines which preventive measures should follow. Other subjects dealt with are those of the cultivation and care of grass land, of certain crops here and abroad, the wood-pigeon, the laying propensities of fowls, and the current market price of agricultural produce; altogether a useful summary of value to the thinking farmer and indirectly to the veterinary practitioner in country districts.

The American Journal of Veterinary Medicine.—The *American Journal of Veterinary Medicine* for August contains a number of original articles on clinical subjects of interest to the practitioner and an especially interesting account of the struggle which the veterinary profession is now making to obtain official status and recognition in the Army. Amongst the statements made in the article on the subject it seems incredible to read that when there was a severe outbreak of surra amongst the Army horses in the Philippines no American veterinarian was sent with the board of officers who went to India to study the disease in that country, and that even when lectures in farriery are given to the soldiers in an Army school the Army veterinarian is not put in authority. Again, not only in the inspection of meat, or the selection and purchase of animals, but even in the selection and purchase of the medicaments required for the treatment of the horses under his care, the Army veterinarian is placed in a very subordinate position. Such a position is intolerable and can only be altered by the creation, as in Europe, of a Veterinary Department, whose officers hold commissioned rank. We in England fully sympathize with our *confrères* in America, for it is only of late years that the Veterinary Corps in the British Army has been put upon a satisfactory footing.

Translation.

COUNT CESARESCO AND THE "CALCULATING HORSES."*

THE Elberfeld horses and their wonderful performances have attracted considerable public attention and, according to newspaper reports, several learned professors are convinced:—

"That the animals think in the abstract like human beings and that they understand spoken languages and intelligently answer questions by stamping with their fore feet at the letters of the alphabet which form the words of their replies; moreover, that they are endowed with mathematical talent, such as enables them to find the roots of numbers."

These pretensions have recently been refuted in an Italian pamphlet by the distinguished author of "The Psychology of the Horse,"† Count Eugenio Martinengo Cesaresco. He does not deny that the horses can indicate letters and numbers by giving the requisite number of knocks, but he denies that they do this as a result of their own thought. He maintains that they have been taught the performances which are so astonishing. Indeed, the greatest wonder of it all seems to exist in the trainer's patience and perseverance, and yet all the credit has been given to the horses. "It must all have taken a long time to teach and to fix in the memory, because numbers and letters make so little impression on the minds of horses." To train horses so highly is such a laborious process that it is hardly ever attempted. In all his experience the writer had only heard of one circus showman, an American, who had taught the numbers and the letters of the alphabet to a horse for performance in public. The case was to have been expertly tested some years ago. The Count recalls that he had been invited to join the Commission of Inquiry, which never came off. The horse and his owner left the country, wisely perhaps, before the arrangements had been completed. The proceedings had been initiated by Professor Hobday, who had been interested in reading "The Psychology of the Horse." He deemed the author to be a suitable examiner of the horse in question. Count Cesaresco's judgment of the somewhat similar attainments of the Elberfeld horses must, therefore, be particularly interesting to the readers of this Journal. He says:—

"Horses can be taught to give the right number of stamps for numbers and letters in connection with a spoken order of few words; but, having learned to stamp out, say, the hour when a clock is shown to them, in association with the words, 'What's o'clock?' the vocal sound of these words alone will cause them to stamp just the same without the presence of the clock as when it was placed before them.

* Sulla: "Pretesa capacita Mentale dei Cavalli di Elberfeld." Salo—Lago di Guarda.

† Published by Fisher Unwin.

"The sound of a spoken command, being associated with a particular action, this will be repeated when the same tones are heard again, because the tone of voice reminds the horses of that which they have previously learned to do and which they have so often repeated on hearing the same sound. It is an illusion to imagine that the literal sense of words is understood by horses. In fact, all languages are the same to them, because they only apprehend and respond to vocal inflections. Whatever language may be used in teaching a horse to start going, it soon learns to move at the sound of the given order, because with this sound there is the association of having originally been forcibly driven and obliged to move. Likewise the horse learns to stop at the word which is associated with restraint of a more or less painful kind.

"Military horses execute elaborate evolutions at the words of command, because these utterances (frequently hardly recognizable as words even by human listeners!) are associated with remembered coercion to move in a certain manner."

It is obvious from all this that the power of association is of the utmost utility in the training of horses. Count Cesaresco does not believe that horses think in the abstract. The nearest approach to abstract thought which he can allow is their thinking of some purposed action before it is accomplished. He maintains, however, that "such thoughts are always caused by some idea which comes from an instinct." Horses think about getting loose in order to help themselves to provender or to go with other horses, but they do not think about mathematical abstractions.

"It is incomprehensible to me that the Elberfeld horses can make mathematical calculations of *themselves* and that *they* can find the roots of numbers." Thus writes the expert horse-trainer, and he specially denies the "possibility of the existence of any actual mathematical faculty in the horse."

This is not surprising, considering that only a very highly-developed human mind is capable of perceiving the abstract ideas which are represented by numbers, and, as we are reminded: "The symbols employed in the expression of mathematical perceptions are of human origin. It was man who invented the particular arithmetical sign which is used to denote the root of a number. It must, therefore, be man alone who can explain its use to the horse."

It is apparently possible to bring this sign to the notice of the horse, but it is not conceivable that the animal could guess at its meaning without the interpretation of its inventor. The Elberfeld horses are surely not supposed to have a greater mental capacity than men, who certainly are not able to find roots of numbers without being taught the process.

The very notion is preposterous. It is hardly credible that the mathematical faculty could have been seriously claimed for the horses in question, so it is excusable for our experienced horse-trainer to allow himself a touch of irony in exclaiming:—

"It is assuredly a piece of great good fortune that the Elber-

feld horses should have 'of themselves' guessed and understood the theory of numbers and that they should have discovered the mode of finding their roots, for I am unable to comprehend how it would be possible to explain the process to them, believing, as I do, that they do not actually understand our human speech, and convinced as I am of their mental incapacity for understanding the roots of numbers and the mode of finding them.

"If the Elberfeld instructor does make his horses indicate the roots of numbers placed before them, these problems are not solved by the horses, but by the man.

"Neither is the stamping of the horses indicative of their ideas, as a certain professor has declared. The code of stamping has not been evolved by the horses, but by their instructor, who has taught them to stamp according to his established code and to give the answers which he himself dictates.

"The indication of numbers and letters by stamping is obviously an acquired art. There is nothing natural and spontaneous about it, for the natural horse paws the ground and stamps in impatience and anger, in defiance of man or of another animal, also to indicate hunger or thirst. Horses must be very highly trained before they will stamp for unnatural reasons.

"A noteworthy fact regarding Elberfeld horses is that they are entire. The selection of such horses is judicious. Stallions for obvious reasons are excitable, consequently they naturally paw the ground and stamp, so this action at least would not have to be taught to them, though their natural propensity would have to be adapted to their instructor's purposes. Other horses or mares would first have had to be taught to stamp, a thing they very rarely do."

As a result of long study the Count's comparisons between the natures of horses and of men are valuable. He says:—

"In the course of breaking-in many horses I have gathered that their disposition, as well as that of other animals, is much the same in kind as the human for deriving ideas from sensation."

Yet the degree of this capacity is shown in other passages to be very different!

The Count also considers that the horse's psychology is not very different from that of mankind. "As in man, so in all animals, ideas are born of impressions made on the senses by external things and are influenced by instincts and bodily needs. The latter are the mainsprings of the actions of animals."

Man is usually credited with some sort of a modifying moral sense, animals being frankly *un-moral*. Like man, animals learn through the association of one idea with another.

"There is nothing new or unreasonable in the belief that animals think, but their thoughts are concerned with their vital requirements, not with mathematics!

"They think of acting according to the promptness of their instincts and the suggestions of their bodily wants.

"The ancients not only knew that animals think, but they believed that once upon a time they could talk."

This is only true in the sense that they can always make them-

selves understood by man or by other animals, albeit without words:—

"Animals talk or express their wants and feelings through variations of vocal tone."

They have one tone of voice for making themselves heard, that is, for calling; another tone of voice shows fear and gives warning of danger; yet another tone belongs to desire to love; and again, a different voice is that of anger.

There is not much difference between the material life and needs of animals and of men. The principal instincts of horses are the same as those of men. Some animals can feel envy, jealousy, sympathy, hate, &c., with regard to some of their fellows. The secondary instincts of animals vary according to the conformation of their bodies and the peculiar requirements which arise therefrom.

The first instinct in all is to look for food. The second instinct is to look for selfish advantage. This is the egotism which makes the strong desire to dominate the weak in order to obtain something more than they. This instinct is most marked in man, who is the most domineering of all animals; living in society being only made possible to men through fear of the penalties which threaten the inordinately arrogant.

Nowadays some scientists are saying that punishment is useless, that it does not serve to deter people from usurpations upon the rights of others; but the ancients all knew very well that impunity leads to crime, which is the result of excessive self-assertion (or prepotency).

The third instinct is that of life preservation, which makes animals aware of dangers that have to be avoided. Here is the province of fear, which is bound up with the instinct of self-preservation.

Through the fourth instinct pleasure is sought and pains avoided, and it is by means of these factors that we are enabled to teach horses and other animals, and to induce them to work in our service.

By their instinct horses know many things without being taught, and they learn other things through their experience of associated good or ill. They seek those who feed them, because eating is a pleasure which they associate with the feeder. They run away from those who have struck them, because they associate the pain of the blow with the striker.

This experienced horse-trainer concludes his pamphlet with the assertion that

"The alleged mental capacity of the Elberfeld horses is a supposition without any logical basis."

I. S. C.

Personal.

MR. T. G. PALGRAVE, M.R.C.V.S., has been appointed a Hon. Veterinary Surgeon to the Auckland Agricultural and Pastoral Association, one of the most important and influential organizations of the kind in New Zealand.

A NEW Veterinary Society has been formed in the South Island of New Zealand, with Mr. John Danskiss, M.R.C.V.S., as its first President, and Mr. Alexander Johnston, F.R.C.V.S., as Hon. Secretary.

Letters and Communications, &c.

Captain Williams; Mr. Motton; Mr. Mitchell; Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Captain Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Captain Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Veterinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.



THE LATE WM. HUNTING, F.R.C.V.S.

Past President of the Royal College of Veterinary Surgeons, Consulting Veterinary
Inspector to the London County Council, and Editor and Proprietor of the
Veterinary Record.

THE VETERINARY JOURNAL

NOVEMBER, 1913.

WILLIAM HUNTING.

WILLIAM HUNTING is dead—and with him passes away one of the strongest pillars of the veterinary profession in this country. Born in 1846, at South Hutton in Durham, the son of a well-known member of the profession, he was initiated during boyhood into the work which he was afterwards destined to follow with such success, and at the age of 19 he had already taken his diploma as a veterinary surgeon at the New Veterinary College in Edinburgh. It was during his college career that he made the acquaintance of Professor John Gamgee, and it was in conjunction with this gentleman that an attempt was made to establish the Albert Veterinary College in the West End of London, Hunting being appointed Professor of Anatomy. Immediately after qualifying, Mr. Hunting was appointed Professor of Veterinary Science in the Royal Agricultural College at Cirencester, a position which he resigned after about twelve months in order to join Gamgee at the Albert College, and afterwards to take up private practice in London. As a keen observer and one whose diagnosis was always made with reasoning and judgment he had few equals, and on the subject of lameness, on which he read many essays, he was everywhere recognized as an absolute authority. Frank in his opinions, he was always courteous, and many a practitioner, of the younger generation especially, will freely acknowledge the help which Hunting was always willing to give.

His text-books on glanders and shoeing are standard works, and for the first named his great experience for so many years as inspector under the London County Council enabled him to acquire a practical knowledge of the disease, which made his opinion asked for and quoted all over the world.

His whole life was devoted to the advancement of his profession, and had he worked as selfishly for himself as he did for

this he might have amassed a large fortune, but he preferred to devote his time to the building up of professional schemes, and his mark has been so indelibly stamped upon the foundation-stone of so many things that his name will never be forgotten. Had he done nothing else but establish and make a success of the *Veterinary Record* he would have deserved the everlasting thanks of the profession, for this epitome of news, appearing weekly, has done more to weld together our small profession than any other thing which was ever brought about. Its establishment upon a firm basis was only accomplished after a very uphill fight, which only those who have ever entered the field of journalism can thoroughly understand, and to accomplish such a work necessitates the greatest of genius and perseverance. Hunting was a genius; that everyone acknowledged, and whether with a patient in front of him, or as an essayist before one of the societies, or even in an after-dinner speech, the audience always knew that the opinions about to be expressed would be the best. Although of late years often ailing he never would give in, and none but his most intimate friends knew really the efforts which he made to be in the forefront of the battle; his will was indomitable, and it was this which kept him up.

President at various times of many veterinary societies, including the National, twice President of the Royal College of Veterinary Surgeons and Member of Council for many years, one of the Board of Examiners both for the Membership and the Fellowship, he occupied nearly every high position the profession could offer, and a further test of his popularity with the rank and file was given when, some few years ago, he was presented with a silver service of plate, and his portrait in oils was placed in the Council Chamber of the Royal College.

To those who could not help themselves he freely lent his aid, and the Benevolent Societies have lost a warm supporter, whilst for the general practitioner his constant appeals for more careful clinical observation will never be forgotten.

It was William Hunting who formed the world-famed quotation which is so often seen in English and American veterinary works: "Skilful observation makes a successful practitioner, but his skill dies with him. By recording his observation he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

The sorrow of the profession will be genuine, for such men are only born occasionally, and not even always one in every century.

Editorial.

THE VALUE (?) OF A LICENCE TO PRACTISE.

IN every civilized country of the world the quack still flourishes, and it is not only in veterinary science, but equally in the medical and dental branches that he is to be found.

In medical work his sphere is naturally somewhat limited, as he has always the question of the death-certificate to think of, and naturally fights shy of treating any apparently serious cases of illness; but in England the prescribing chemist earns many a fee which should legitimately go into the pocket of the qualified medical man, and this in Germany is forbidden by law. At the same time the chemist is protected in his turn, and the veterinarian as well as the medical man is forbidden to dispense.

The decision given in the recent case of the Royal College of Veterinary Surgeons *v.* Kennard made one almost wonder wherein lies the value of the diploma when the law can be evaded by such easy subterfuges as were here adopted. The judgment given may interpret the letter of the law, but it certainly does not interpret correctly the spirit of the Act which was intended to protect the public and their animals from interference when ill by ignorant "know-alls."

The defendant "Kennard" put upon a brass plate, which was duly affixed in a prominent position on his place of business, the words "A. E. Kennard, Canine Surgery," and apparently, from the summings-up of the three learned judges, this is quite allowable—or rather, cannot be prevented—although the person who does this is unable to enforce the payment of a fee. This little difficulty, however, is easily got over by the enforcement of the "cash in advance" principle.

In the description of one's place of business we are somewhat similarly placed as the dentists are, for with them it is no offence against the law to use such enticing phrases as "American Dentistry" or "Dental Parlour," "Teeth Extracted," &c., and dental surgeons who are properly qualified, and have spent a lot of money in attaining their diploma, meet with unqualified oppositions, who work at a cheaper rate, in every town and at every turn.

Surely some method can be found to remedy this state of

affairs, and it is to be hoped that an astute lawyer will show a way out of the difficulty when the time approaches to secure the passing of the new Charter.

The dental and medical professions are as hard hit as we are, and at the recent Congress in Birmingham the subject received special attention, one suggestion, which seemed to meet with a great deal of favour, was that it should be made compulsory by law to always use an anæsthetic before a tooth is extracted. If such a clause became law, so that it would be an offence not to make the operation painless, then a great triumph will have been won, for very few untrained men would dare to play with such toxic agents as cocaine and the other local anæsthetics.

Presently some way will be found to circumvent the "quack," but in the meantime, with no money to carry the case further, we are compelled to submit to the law as it now stands and has to be interpreted.

A DIPLOMA IN VETERINARY STATE MEDICINE AND THE FELLOWSHIP DEGREE.

A GREAT improvement has been made in the regulations for the Fellowship Diploma, and the attention of all, especially the younger graduates, should be particularly called to it.

Instead of a minimum period of five years after obtaining the Membership Diploma, two years only will, when the new regulations come into force, be needed, and a candidate may select to be examined (and present a thesis) from nine different headings. If his particular "bent" is anatomy, physiology, or pathology, he can specialize in either of these, whilst if he has spent his life in hot climates he can select tropical medicine; or, again, if sanitary science has been his special study he can elect to be examined in this. For the latter, however, he must already possess the diploma in Veterinary State Medicine, which is a new creation and has been wanted for many years. This diploma can be late or early, or twelve months after graduation, and the syllabus for it is sufficiently comprehensive to make the prospective student understand that he will have to work in order to obtain it.

The alterations and regulations are a distinct advance, and in the future will undoubtedly attract many more graduates into the ranks of the Fellows than has been the case in the past.

INTERNATIONAL VETERINARY CONGRESS, 1914.

A MEETING of the Organizing Committee of the above Congress was held at the Royal College of Veterinary Surgeons, 10, Red Lion Square, on Friday, October 10, 1913.

Present.—Messrs. Almond, Archer, Banham, Bullock, Carless, Carter, Clarke, Dunstan, Garnett, Hancock, Lawson, Litt, Locke, Professor J. McCall, Dr. J. McL. McCall, Mr. MacCormack, Sir John McFadyean, Messrs. McIntosh, Male, Professor Mettam, Mr. Price, Major-General Pringle, Professor Reynolds, Lieut.-Colonel Rutherford, Mr. Samson, Professor Shave, Messrs. Simpson, Slocock, Major-General Smith, Mr. Spicer, Sir S. Stockman, Major-General Thomson, Major Todd, Messrs. Trigger, Villar, Wharam, Willett, Professor Wooldridge.

Minutes.—After reading the minutes of the previous meeting, the Hon. Secretary reported that he had received apologies for absence from several colleagues.

Army Representatives.—The Hon. Secretary reported that he had received a letter from Major-General Pringle nominating Colonels Rutherford and Butler and Lieut.-Colonel Moore to represent the Army Veterinary Service on the Organizing Committee.

Correspondence.—The Hon. Secretary stated that he had received applications from non-professional gentlemen who desired to become members of the Congress. It was pointed out that by the standing rules only those persons who were elected by former Congresses on account of their scientific work were honorary members.

With regard to non-professional men it was pointed out that it was not usual to admit these as members of the Congress unless they were delegated by bodies qualified to do so.

Correspondence from certain scientific men of different countries proposing subjects for discussion, which were not on the official programme, was discussed, and it was decided that the existing programme should not be added to, as it was likely to become overloaded thereby.

In consequence of the correspondence the question was again raised as to whether donations should be received from trading firms whose business interested them in veterinary affairs, and it was decided that subscriptions to the organizing fund should not be limited to members of the veterinary profession.

Hon. Secretary's Report of Progress.—The Hon. Secretary reported that the Board of Agriculture had communicated with the Foreign Office and the Colonial Office, and had suggested that invitations should be sent out. The following despatches had accordingly been sent from the Foreign and Colonial Offices:—

[COPY.]

Downing Street,

September 10, 1913.

SIR,—I am directed by Mr. Secretary Harcourt to acknowledge the receipt of your letter No. A. 4359/1913, of July 30, on the subject of the representation of the British possessions at the International Veterinary Congress which is to be held in London next year, and to state, for the information of the Board of Agriculture and Fisheries, that a copy of their letter has been sent to each of the self-governing Dominions and States, to the High Commissioner of South Africa, and to the undermentioned British Colonies and Protectorates:—

British Guiana.	St. Christopher-Nevis.
Jamaica.	Cyprus.
Trinidad.	Malta.
St. Vincent.	Nyasaland.
Ceylon.	Uganda.
Straits Settlements.	Sierra Leone.
Malay States.	Gold Coast.
East Africa Protectorate.	

Mr. Harcourt is also communicating a copy to the British South Africa Company.

I am, Sir,

Your most obedient servant,

(Signed) H. W. JUST.

The Secretary,

Board of Agriculture and Fisheries.

[COPY.]

Foreign Office,

September, 1913.

His Majesty's Representatives Abroad.

SIR,—I transmit to you herewith copies of the programme

of the Tenth International Veterinary Congress, which it is proposed to hold in London from August 3 to 8 next year, with the request that you will communicate it to the Government(s) to which you are accredited inviting them at the same time to send delegates thereto.

The history of these Congresses is as follows:—

Forty-nine years ago, at the suggestion of a distinguished British veterinarian, John Gamgee, the first International Veterinary Congress was held. Gamgee's suggestion was put forward on account of cattle plague, which had travelled from Russia practically all over Europe devastating the herds, and he recognized that the control of animal plagues could not depend entirely upon each country itself, but must be the common care of all. The wisdom of Gamgee's suggestion was immediately recognized by all the European countries. These Congresses, *inter alia*, discuss all international questions in relation to animal plagues.

Arrangements could not, unfortunately, be made to hold the first or any of the other Congresses in Great Britain, but they have been by arrangement held every five years in various capitals of Europe, Paris, Brussels, Berne, Baden-Baden, Budapesth. The Governments of the various countries concerned have always issued invitations to other Governments to send delegates.

The ninth Congress was held at The Hague in 1909, and on that occasion the Governments of Argentina, Austria (including Bohemia, Croatia and Slavonia), Bavaria, Belgium, Bulgaria, Colombia, Cuba, Denmark, Germany (including Saxe Weimar), France (including Algeria and Tunis), Greece, Guatemala, Hungary, Italy, Japan, Luxemburg, Mexico, Norway, Netherlands, Roumania, Russia, Saxony, Servia, Sweden, Switzerland, United States of America, Uruguay, and Württemberg were represented, as well as Great Britain and certain of the British Oversea Dominions.

Although the Congress is not promoted by His Majesty's Government, they take a great interest in the objects for which it is being summoned, and would learn with pleasure that the invitations had been accepted. They would also view with satisfaction the separate representation at the Congress of such educational, scientific, or other bodies in foreign countries as are interested in promoting the veterinary and kindred sciences.

The Chairman said that it was very satisfactory that invitations in the terms they had just heard read had been sent out. That was one of the difficulties in the way of having England selected as a place for the meeting of the Congress. The members of the Permanent Commission were averse to a Congress being held in any country in which it was not recognized by the Government of that country.

It was also stated that the Foreign Office had promised to give a reception in honour of those attending the Congress, and they were thus taking a real interest in the undertaking.

In reply to Mr. Carless, the President stated that the Foreign Office would take no interest in financing the Congress, but intimated that they were not treating the veterinary profession any differently from the way in which other Congresses were treated financially. There was no precedent for the British Government giving a subsidy to any Congress of the sort.

The Hon. Secretary's Progress Report was considered very satisfactory.

Treasurer's Report.—The Treasurer reported that new subscriptions had come in very slowly since the previous meeting. The total amount now promised was about £3,180; that was £320 short of what was required. They had set out to get £3,500, but as £500 of that was ear-marked as a Special Reserve Fund they could not call upon that unless the amount subscribed in the ordinary way was not sufficient to meet the expenses. They still required £320 in order to reach the minimum originally fixed. Death had carried off a certain number of those who had promised to subscribe. As he had not received any answer to his requests for payment from certain members who had promised a subscription, he thought it possible that some of the promised subscriptions might not be forthcoming. A large number of the English veterinary surgeons had not yet subscribed, and he thought it would be well to make another appeal to those who had not done so. The veterinary societies had in very many cases done what they could in the way of securing subscriptions, and it was to the credit of the smaller societies, and especially certain of them, that they had received the very handsome sum they had already in hand by promise. Some of the larger societies were still at work, such as the Lincolnshire, Yorkshire, and the Central in London, and he thought they might

hope to reach the original minimum; but he was forced to lay stress on the fact that they now knew there was every prospect of a much larger number of delegates and representatives being present at this Congress than at any previous Congress, and he was of opinion that the minimum sum fixed would be much too small.

The Hon. Secretary stated that at a previous meeting the exceptionally large number of representatives expected at this Congress had been discussed, and in accordance with the directions of the Committee to extend the subscription list to all members of the Royal College of Veterinary Surgeons, whether resident in the British Isles or not, he had sent out a circular inviting subscriptions from all members in the British colonies and other countries.

The Hon. Treasurer stated that he had already received substantial subscriptions from some of the members of the Royal College who were resident elsewhere than in the British Isles.

Mr. Dunstan asked how many veterinary surgeons had promised to subscribe, and the Hon. Treasurer replied that he had not the exact figures, but the number was less than three hundred.

The Chairman stated that it did seem pitiable to think that only about three hundred out of some three thousand members on the register had subscribed, or even promised to subscribe to the Congress. It meant just one in ten.

The Hon. Treasurer stated that, unfortunately, some members seemed to think that their obligations had been met when the society of which they were members sent a subscription. He desired to point out that that was not the case.

In reply to a question the Hon. Treasurer stated that the amount of money actually in the bank was £1,050. He urged upon all members to try and get another ten to pay at least £1 each to the Organizing Fund.

The Chairman suggested that it ought to be very easy to do that; more easy than to get ten men, as they had got, to give £100 each.

It was suggested that a further application should be issued by means of a letter from the President, in which it should be pointed out that the expenses of each individual member of the Congress would be about £3, and that the ordinary subscription of membership—£1—would not cover it.

This was agreed to.

Exhibits.—The Hon. Secretary asked for instructions with regard to exhibits, and it was decided that exhibits by manufacturing firms should be allowed.

Assistant Secretaries.—The Hon. Secretary asked for permission to appoint assistants to help him in his work, and to add their names to the Organizing Committee.

This was agreed to.

It was also agreed that the skeleton programme should be prepared and issued, together with forms for membership subscriptions.

Place of Meeting.—The Chairman stated that it was very urgent that rooms should be engaged at once for the meetings of the Congress or they might find it impossible to get a suitable place. He suggested that a Sub-Committee should be appointed to make inquiries and to engage a suitable place or places for holding the meetings.

It was resolved that a small Sub-Committee, consisting of the Chairman, the Hon. Treasurer and Secretary, together with Messrs. Willett, Price and Wooldridge, be appointed to make inquiries and to engage the necessary rooms.

Reporters.—It was also resolved that the Sub-Committee appointed to select scientific men to contribute papers should have power to make the final selection of reporters.

MEETING OF THE SUB-COMMITTEE FOR THE SELECTION OF REPORTERS.

The above Sub-Committee held a meeting after the business of the Organizing Committee was completed.

Nominations with reference to reporters recommended by Committees in the various countries and colonies were considered. A list was drawn up, but it was considered inadvisable to publish this list until the various individuals had given their formal consent to act.

General Articles.

NOTE ON RINDERPEST. *

By E. W. OLIVER, M.R.C.V.S., F.Z.S.

Superintendent, Civil Veterinary Department, United Provinces.

OF the many deadly forms of cattle disease which from time to time devastate the herds and flocks throughout the length and breadth of the Indian peninsula, that animal plague known as rinderpest must be regarded as the most serious. Seldom or never is this country entirely free from its unwelcome presence, and it would be almost impossible to estimate with any degree of accuracy the number of animals which annually succumb to its ravages, or the financial loss to the country arising therefrom. Considering it is one of the most commonly met with of the contagious animal diseases, it is astonishing to find how little really is known about it by the public generally, and even amongst those persons whose hereditary occupation is that of breeding, grazing, and rearing of stock much ignorance as to its nature exists. Frequently the disease is not recognized or is hopelessly confounded with others, and still more often it is regarded as a divine visitation in which interference for the purpose of prophylactic treatment or prevention of its spread is regarded as not only futile but even presumptuous.

Rinderpest is a highly contagious fever and appears to be distinctly typhoid in character. It is of sudden onset, rapid and violent in progress and marked by great constitutional disorder, and accompanied by congestion, eruptions, and blood extravasations extending practically over the whole of the mucous membranes of the mouth and alimentary tract. It is especially characterized by the appearance of white bran-like concretions or ulcers which are found on the inside of the mouth or lips, and although often accompanied by a high mortality, this feature is governed to a very great extent by race, conditions, and environments, and according to the susceptibility of the animals exposed to its infection.

Although the name would indicate that it is essentially a disease of cattle, other ruminants, especially sheep and goats, are subject to its attacks and infection is even known to extend to deer, antelopes, camels, and swine. As far as can be ascertained, man, equines, rabbits, and birds are never affected. Susceptibility exerts a considerable influence on the severity of the disease and the rate of

* Being Bulletin No. 28, Agricultural Series, and issued by the Department of Land Records and Agriculture, United Provinces of Agra and Oudh.

mortality in animals usually subject to the disease. Cattle and buffaloes seem to be the most susceptible, and although sheep and goats both become attacked the mortality amongst goats is usually more severe than with sheep.

Although in Europe the disease always seems to be of the most virulent type, in India we find it often assumes a benign and mild form, the animals of some tracts being less susceptible than those in others, which have for centuries been visited by this disease.

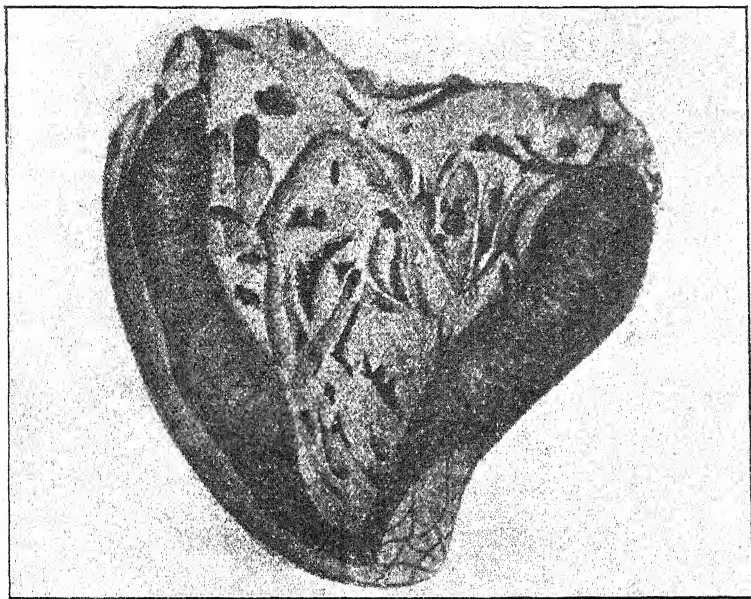
It is also noticed that in some parts of the plains certain animals possess such a very strong degree of immunity that when an outbreak occurs the death-rate is comparatively small, the majority of animals going through very mild attacks to eventually recover, while others will even pass through an outbreak unscathed and unaffected.

In the hill districts, where the virulent type mostly occurs, as well as in those countries which have been newly attacked, the mortality will rise to as high as 75 per cent., and although a fair proportion may survive the outbreak and actually recover, the disease generally affects them in a much more severe manner than it does the ordinary cattle of the plains. Immunity then may be either natural, hereditary, or acquired. One attack of the disease generally renders an animal immune to subsequent infection, and even calves born of cows who have recovered from rinderpest during gestation have been known to escape the disease. It is believed that in certain districts habitually visited by cattle plague for many generations the animals have acquired hereditary immunity.

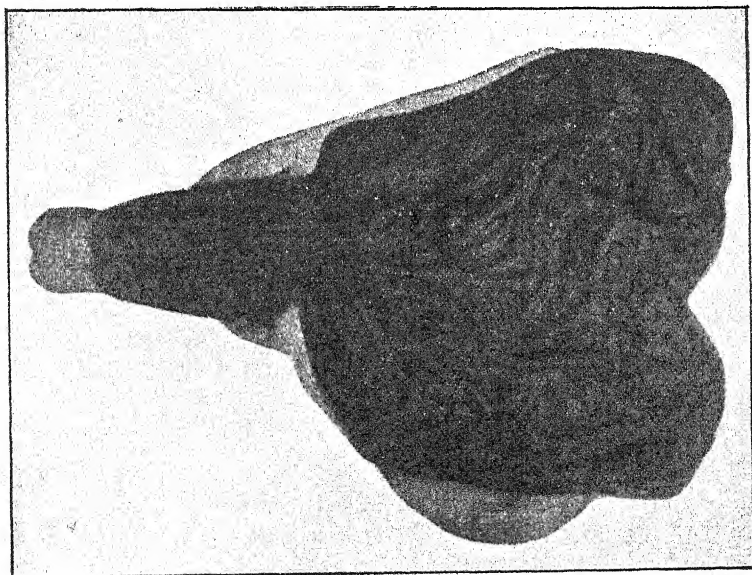
In most countries incubation appears to take from three to seven days, although in outbreaks which have occurred in England four to six days has been estimated. A slight rise of temperature without other symptoms has been noticed as early as thirty-six hours after exposure to the contagion.

This disease is due to what is described as an "ultra-visible" virus; in other words, it is believed to arise from the presence of germs which are too minute for observation even with a high-power microscope, and which are able to pass through almost the closest of filters.

No organism has up to the present been isolated that can be successfully inoculated into other animals to produce the disease, but although it is practically certain that the essential cause is a germ, accessory and predisposing causes are necessary for its development and spread.



Left ventricle of heart of affected animal.



Fourth stomach of ox with rinderpest.

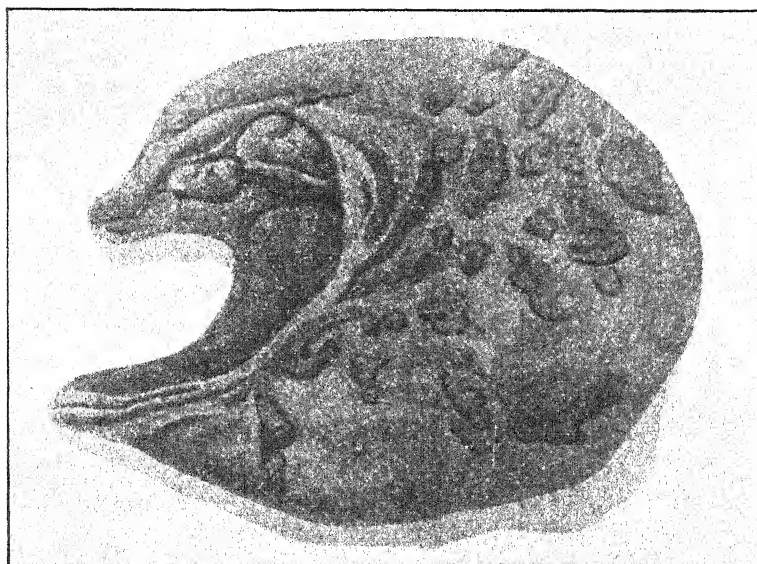
The blood, fæces, saliva, and other secretions and excretions of animals sick from this disease are extremely virulent, and manure, hay, straw, hides, &c., all may become factors in spreading the virus, which undoubtedly possesses great vitality. The disease may also be conveyed on the boots or clothes of persons and is even said to be conveyed in this country (India) by birds. The infection can be destroyed by heat and by extreme cold.

The symptoms of this disease vary considerably with the virulence of the attack, or the susceptibility of the animal. Although the following description fairly represents the onset and progress of a really bad case, it must be remembered that in India these symptoms are not always so well marked, but at the same time while certain diagnostic symptoms are never absent there are many other conditions, &c., which simultaneously appear, but which may vary with each individual case. Usually the first indication is a rise of temperature, which may be from 102° to 105° or 106° F. This in a locality where the disease is known to be prevailing is sufficient to justify the animal being regarded as suspicious, or as sickening for the disease. The fever is usually accompanied by shivering fits, dulness, and a short cough ; as well as loss of appetite and often constipation. The temperature increases daily to the third or fourth day when further symptoms begin to develop.

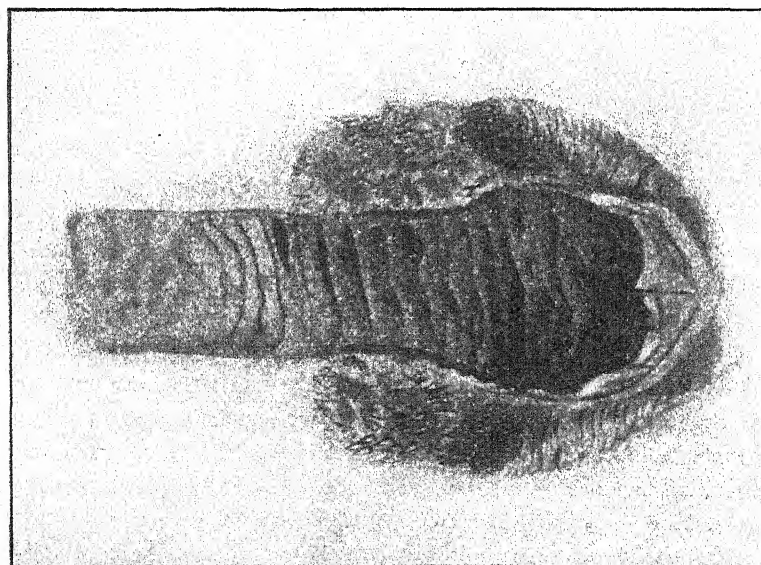
These sometimes consist of a spasmodic twitching of the muscles, great thirst, and partial or total suspension of rumination. The animal will generally be noticed to be standing with his head down and his back humped up.

Respiration becomes quickened and a discharge from the eyes commences. White, bran-like concretions appear on the inside of the lips and extend to the tongue and the roof of the mouth. The appearance of this eruption, which somewhat resembles thrush or aphtha, is very distinctive of rinderpest, especially when accompanied by fever and the other constitutional symptoms. If the attack be a very severe one this condition now rapidly becomes worse.

There is a continuous discharge of mucus from the eyes, mouth, and other orifices and excoriations, whilst congestion and blood extravasation is noticed in the mouth and often in the rectum. Occasionally at about this stage a skin eruption appears. There is now evidence of great prostration and suffering. As the disease advances diarrhœa sets in with passage of watery, offensive and foetid fæces often coloured with bile and blood, and this condition



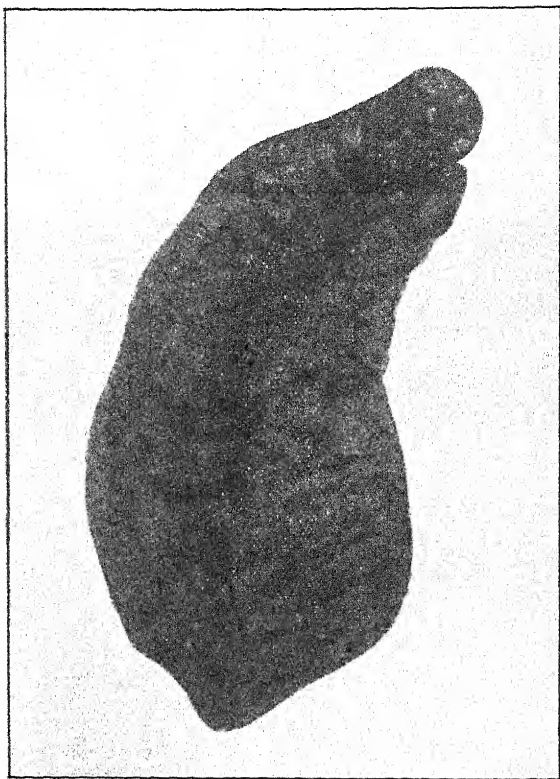
Gall-bladder of ox which died of rinderpest.



Mouth and a palate showing excoriation ulcers and deposit.

continues till the anus and rectum become red and inflamed. Respiration steadily becomes worse, being often accompanied by a moan and clicking noise at each breath. In very violent cases death may take place from the sixth to the ninth day, and occasionally earlier.

There are many diseases which may be likely to be mistaken



Caecum of ox, showing congestion, ulcers, and patches of exudate.

for rinderpest by the inexperienced, but with careful observation of the nature of the lesions, the rapidity with which death ensues, or otherwise, as well as other conditions, such mistakes should be avoided by the careful stock-owner.

Foot-and-mouth disease is a condition which is sometimes mistaken for rinderpest, and cases have been known where these two maladies have existed together, but this of course is unusual. The

concretions or eruptions found in the mouth differ greatly in these two diseases. In rinderpest they appear as white epithelial spots, while in foot-and-mouth disease the skin appears to be raised in the form of a blister by a clear yellow serous fluid. The presence of vesicles between the digits and the absence of progressing mortality and severe constitutional symptoms should be sufficient to prevent confusion.

Anthrax is distinguished by its being a more enzootic disease, and not spreading as widely as rinderpest. There are no eruptions in the mouth and there is often swelling of the throat and enlargement of the spleen. This disease also is found to affect horses and dogs, which is not the case with rinderpest. Lastly, if any doubt exists, detection of the presence of the bacillus will settle the matter.

Hæmorrhagic Septicæmia.—Here again no lesions usually occur in the mouth. There is usually a large swelling of the throat with serous effusions and difficulty of breathing. This disease also generally runs its course much more rapidly than rinderpest and death occurs very soon.

Thrush, Stomatitis, and Erosions in the mouth from strong medicines, poisonous grasses, &c., or corrosive poisons may usually be distinguished by the nature of the eruption, the absence of fever and constitutional symptoms and the general nature of the distribution of affected animals.

No really satisfactory method of drug treatment has yet been demonstrated that can be said to be of much general avail, although in certain mild cases administration of medicines has appeared to be beneficial. In Europe this disease always appears in a very malignant form, hence the severest measures are adopted to suppress it. These consist of immediate compulsory destruction of diseased, suspected or in-contact animals, supported by legislation to prevent movement of animals to or from infected areas.

It is obvious, however, that India is a country in which these measures would be impossible or highly impracticable: firstly, from religious convictions connected with the bovine race; and secondly, from the nature of the country. In India it is not fenced, as is the case in Western countries, and so there is nothing to prevent diseased cattle wandering unheeded amongst healthy ones and infecting them; and hence, owing to the apathy, ignorance, and prejudice of the cultivating classes, it is doubtful if legislation,

if introduced, could be successfully applied. Again, the draught bullock being the chief factor in Indian transport, strict prohibition of movement would probably lead to partial suspension or paralysis of commerce in busy commercial centres. Therefore, in India, as things are at present, it is apparent that the best that can be done for the control of rinderpest is to try and prevent its development and spread ; and in the absence of the measures just mentioned, this can only be accomplished by rendering animals immune from infection wherever possible by preventive inoculation and strict attention to hygiene. The best means suited to attain this end (*i.e.*, the eradication of rinderpest) are the stamping out of outbreaks by a liberal use of serum, if obtainable. In India this material is manufactured at the Imperial Bacteriological Laboratory, Muktesar, under the direction of Major J. D. E. Holmes, M.A., D.Sc., and is issued to the various provinces to be used under the supervision of the provincial superintendents of the Civil Veterinary Department and to native estates, &c., by those persons qualified to use it.

There are three principal methods of inoculation. Each has its advocates and its merits, but only one is suitable for general practical application in India, and this is known as the "serum alone method."

The anti-rinderpest serum is a protective and perhaps curative material obtained from animals who have already been actively immunized against rinderpest. An ox already partly immune against the disease, either by a natural or artificial process, is treated in such a way until finally it can withstand the greatest amount of infection that it is possible to expose it to, and from this animal the protective material is obtained.

The immunity induced by serum seems to last only from three to six weeks in India, but in a country such as this, where cattle plague is already diffused, this is often sufficient to act as a barrier against spread in certain directions.

In making use of the "serum alone method" it is necessary to inoculate all susceptible animals likely to come in contact with the infection ; moreover, strict isolation of the infected herd must be rigidly enforced. All movements of animals either into or out of the infected area should be prohibited until the outbreak is at an end.

It will often be found necessary in a new outbreak of disease in any way resembling rinderpest, to make a careful *post-mortem*

examination of the first two or three animals that succumb to the malady, in order to confirm the diagnosis and to prevent mistakes. Usually the most important indications are to be found in the mouth, the fourth stomach, and the small intestines, &c. These are found to be in a very congested state and often covered with patches of yellow or white exudate, which have the appearance of patches of moist flour or bran. If the case is a bad one this condition will be found almost throughout the body and over the surface of nearly all the mucous membranes, as well as in the gall bladder. Sometimes the lungs show patches of inflammation and there is sometimes ulceration of the windpipe. In the rectum and vagina are found blood extravasations, and the heart is often pale in appearance with little spots of blood infiltration.

THE PREVENTION OF HUMAN TUBERCULOSIS OF
BOVINE ORIGIN (PARTICULARLY FROM THE
POINT OF VIEW OF THE TUBERCULOSIS ORDER.
1913).*

By WILLIAM G. SAVAGE, M.D.
County Medical Officer of Health, Somerset.

THIS problem involves three considerations: (1) The extent to which human tuberculosis is of bovine origin; (2) the prevention of human infection from bovine sources; (3) the diminution of bovine tuberculosis.

As regards the relationship of bovine to human tuberculosis, and the intercommunicability of the two types, I do not propose to make any extended remarks. Every person who has read the careful experiments and deductions of the last English Royal Tuberculosis Commission, backed up and confirmed as they are by numerous experiments carried out in other parts of the world, can have no doubt of the relationship, although there is still room for discussion as to the *amount* of human tuberculosis of bovine origin.

We may accept the words of the Royal Commission:—

“ There can be no doubt but that in a certain number of cases the tuberculosis occurring in the human subject, especially in children, is the direct result of the introduction into the human body of the bacillus of bovine tuberculosis; and there can also be

* Read at the Exeter Congress of the Royal Sanitary Institute.

no doubt that, in the majority at least of these cases, the bacillus is introduced through cows' milk. Cows' milk containing bovine tubercle bacilli is clearly a cause of tuberculosis, and of fatal tuberculosis, in man."

We are not yet in a position to definitely state the proportion of human tuberculosis of bovine origin, although data are steadily accumulating. In my opinion, the most reliable estimate is that based upon the determination in human cases of the types of tubercle bacilli present.

Park and Krumwiede, in a series of valuable papers, give their own findings, and the results of a number of other groups of investigators, as regards the presence of human and bovine tubercle bacilli in human cases of tuberculosis. Their results are shown in Table I.

Apart from exceptional circumstances, bovine infection to man is spread entirely from tuberculous meat and milk, including milk products. Of these, milk, and to a less extent butter, is by far the most important, and must be regarded as the main vehicle of infection.

Considering milk alone, the second consideration resolves itself into, How far can human infection be prevented from tuberculous milk?

Roughly speaking, not less than 10 per cent. of ordinary milk samples contain tubercle bacilli in an active virulent condition (to the guinea-pig). In milks sent to Sheffield, for example, examined in 1911, the percentage was 9·8; in London for the same year 10·8 per cent.

These bacilli are derived from cows suffering from tuberculosis; but, as is well known, not all tuberculous cows excrete tubercle bacilli, but only those which are "open" cases of tuberculosis. For practical purposes such cows comprise three groups: (a) Advanced cases of tuberculosis; (b) cows suffering from tuberculosis of the udder; (c) cows suffering from "open" tuberculosis apart from (a) and (b).

Undoubtedly group (b) is the most important source of tubercle bacilli to milk, while group (c) furnishes the smallest number of tubercle bacilli.

The administrative procedure for dealing with these animals is contained in the Tuberculosis Order, 1913, of the Board of Agriculture, which came into force on May 1 last. It is important

TABLE I.—COMBINED TABULATION, CASES REPORTED INCLUDING THEIR OWN SERIES OF CASES.

Diagnosis	Adults 16 years and over		Children 5 to 16 years		Children under 5 years	
	Human	Bovine	Human	Bovine	Human	Bovine
Pulmonary tuberculosis	644	1(?)	11	—	23	1
Tuberculous adenitis. Axillary or inguinal	2	—	4	—	2	—
Tuberculous adenitis cervical ...	27	1	36	21	15	21
Abdominal tuberculosis	14	4	8	7	9	13
Generalized tuberculosis. Alimentary origin	6	1	2	3	13	12
Generalized tuberculosis	29	—	4	1	43	5
Generalized tuberculosis; including meninges. Alimentary origin	—	—	1	—	3	8
Generalized tuberculosis; including meninges	5	—	7	—	52	1
Tubercular meningitis	1	—	3	—	27	4
Tuberculosis of bones and joints ...	27	1	38	3	26	—
Genito-urinary tuberculosis	17	1	2	—	—	—
Tuberculosis of skin... ..	3	—	1	—	1	—
<i>Miscellaneous cases</i>						
Tuberculosis of tonsils	—	—	—	1	—	—
Tuberculosis of mouth and cervical nodes	—	1	—	—	—	—
Tuberculous sinus or abscesses ...	2	—	—	—	—	—
Sepsis, latent bacilli	—	—	—	—	1	—
Totals	777	10	117	36	215	65

Mixed or double infections, 4 cases.

Total cases = 1,224.

From this table they obtain the following, showing the percentage incidence of bovine infection :—

TABLE II.—PERCENTAGE INCIDENCE OF BOVINE INFECTION.*

Diagnosis	Adults 16 years and over	Children 5 to 16 years	Children under 5 years
Pulmonary tuberculosis	0	0	4.1
Tuberculous adenitis, cervical	3.6	3.6	5.8
Abdominal tuberculosis	2.2	4.6	5.9
Generalized tuberculosis	2.7	4.0	2.3
Tubercular meningitis (with or without generalised lesions)	0	0	13.6
Tuberculosis of bones and joints	3.5	7.3	0

* For further comparative data, see the writer's "Milk and the Public Health." Macmillan and Co. 1912.

to consider the extent to which this very important Order is likely to eliminate altogether or to diminish the presence of tubercle bacilli in milk.

In the words of the covering circular of the Board, the Order "aims at securing the destruction of every cow found to be suffering from tuberculosis of the udder, or to be giving tuberculous milk, as well as of all bovine animals which are suffering from tuberculosis with emaciation."

To detect these animals, two lines of procedure were available. On the one hand local authorities might have been required to arrange for systematic inspection of the cows and bovine animals in the area under their jurisdiction, with the view of finding the above classes of tuberculous animals; or, on the other hand, all owners of such animals might be required to notify them to the local authority. The second procedure has been adopted, and it is now the duty of those owning such animals to give information of the fact to an officer of the local authority without avoidable delay.

In the practical working of this Order certain criticisms and questions suggest themselves, of which the most important is the extent to which it is likely to result in an elimination of tubercle bacilli from milk. It is clear that only a diminution of the percentage of tuberculous milk, and not a total elimination, is to be looked for.

In the first place, both as regards cows suffering from tuberculosis with emaciation ("wasters") and cows suffering from udder tuberculosis, particularly the latter, it will, I believe, inevitably result that, in at least many cases, there will be a long delay, possibly of many months' duration, between the time these cows become active distributors of tubercle bacilli into milk and their detection by the veterinary inspector of the local authority. During this period not only will tubercle bacilli be added to the milk, but these highly dangerous animals will have abundant opportunities of infecting other cows in the herd.

Again, not only will detection be frequently late in the course of the disease, but in the case of tuberculosis of the udder a number of cases will be overlooked and missed. The published opinions of expert veterinary authorities clearly show that even with competent and skilful veterinary surgeons the diagnosis of early tuberculosis of the udder may be a very difficult matter.

This point is so important that a few authorities may be quoted in support of it. For example, Dewar* says:—

“In the udder the progress of the disease is often slow, and there is no doubt but that it may exist for weeks in such a condition as to render the milk dangerous before the most expert clinician could detect its presence.”

Nocard† remarked that the diagnosis of tuberculous mammitis is “both urgent and difficult; the clinical symptoms are vague, and generally point to a range of probabilities which are more or less certain. Even if the cow has reacted to tuberculin, it does not necessarily follow that the induration of its udder is tuberculous, for tuberculous cows, as well as healthy ones, are liable to contract mammitis of various natures.”

Professor Delépine,‡ who has had great experience in this problem, remarks:—

“Tuberculosis of the udder can be detected with great accuracy by a combination of veterinary inspection of the cows and of bacteriological examination of milk obtained from udders showing signs of disease, more especially enlargement and induration. It is, unfortunately, impossible for the most experienced veterinary surgeon to distinguish, by inspection and palpation, tuberculous mastitis from all other forms of mastitis. It is also practically impossible for the veterinary surgeon, unaided, to discover by ordinary inspection early tuberculous lesions of the udder.”

Delépine, indeed, found in his work at Manchester, and working with highly experienced veterinary inspectors, that not more than one-third of the udders which on inspection appeared to be possibly affected with tuberculosis were on bacteriological examination proved to be actually tuberculous. The Sheffield results afford evidence in the same direction.

Finally, the discrepancy between clinical and *post-mortem* results may be mentioned. As an example, the following data from a report of Dr. Wilson,§ County Medical Officer of Health, Lanark, may be quoted. He found that out of 42,024 cows examined in four years by experienced veterinary surgeons only

* *Transactions*, British Congress on Tuberculosis, 1901, vol. iv, p. 3.

† *Ibid.*, p. 8.

‡ “Report of the Medical Officer of the Local Government Board, 1909,” p. 412.

§ “County Medical Officer of Health’s Report (17th),” p. 23.

·08 per cent. showed udder tuberculosis. In contradistinction to this, at the Bellshill public slaughter-house, where careful records were kept, the number of cows found to have had udder tuberculosis was about 2·6 per cent. He concludes, as regards udder tuberculosis, that "at present we may assume that less than one-thirtieth of the actual number can be detected."

While certainty in the diagnosis of udder tuberculosis cannot be attained by clinical examination alone, many if not most of the difficulties can be removed by the use of combined clinical and bacteriological examinations. The Tuberculosis Order contemplates the use of such combined examinations; and the Board of Agriculture, in their circular of March 25, 1913, directs local authorities to "issue instructions to their veterinary inspectors that in the case of cows suspected of having tuberculosis of the udder or giving tuberculous milk, samples of their milk should be centrifugalized and examined for tubercle bacilli with the microscope."

It may be mentioned in passing that while simple microscopic examination is usually sufficient to detect tubercle bacilli in milk samples from individual cows, it is not only quite unreliable for mixed milk samples, but in a certain proportion of single cow samples the bacilli will fail to be detected, particularly if the sample is badly collected.

Summing up the matter as regards tubercle bacilli in milk, it is evident that if the Order is properly and vigorously put into force, there will be a considerable and very valuable reduction in the amount of tubercle bacilli in milk, but very far from a complete elimination of tuberculous milk. Tubercle bacilli will still gain access to milk from the following sources: (a) "Wasters" and udder tuberculosis cases not yet reported and slaughtered; (b) missed cases of cows suffering from udder tuberculosis; (c) cows with other varieties of "open" tuberculosis neither reported nor detected.

The benefit is very considerable, but the compensation to be paid is very heavy, and, in my opinion, can only be justified if it is largely a non-recurrent expenditure, or at least one which will very largely diminish within a few years. While everyone admits that the expenses in the first few years will be very heavy and out of proportion to the normal expenditure, it is usually advanced that after a few years there will be a great diminution of the

compensation to be paid, due to a diminution in bovine tuberculosis generally, and particularly in the varieties of tuberculosis which have to be notified.

It is clear that the prevention of human tuberculosis of bovine origin cannot be separated from the prevention of tuberculosis amongst bovine animals, and that no steps can be permanently satisfactory unless they definitely aim at a diminution of the total bulk of bovine tuberculosis. I am not sanguine that the present Tuberculosis Order, as it is likely to be put into operation in the different areas, is likely to largely diminish the amount of bovine tuberculosis.

It has been shown above that at least the great majority of cases of udder tuberculosis and "wasters" will not be detected and slaughtered until *after* they have been actively excreting tubercle bacilli for long periods, and have had abundant opportunities of infecting other cows in the herd. When the other cows have been exposed to extensive and continuous infection, and a considerable proportion has become infected, the local authority steps in and removes the active centre of infection.

It is much worse than trying to prevent the spread of human tuberculosis solely by the removal of advanced human cases, since the latter can be taught to control their expectoration, while cows are especially sensitive to infection. Also the grossly insanitary condition of many cowsheds greatly favours infection.

The powers are similar to those of the Model Clauses, and where these have been in operation and these cows have been weeded out, no percentage diminution of udder tuberculosis has been noticeable. This is shown by the following table:—

Year	MANCHESTER		SHEFFIELD	
	Percentage of outside cows found with udder tuberculosis		Percentage of country cows with udder tuberculosis	Percentage of city cows with udder tuberculosis
1901	1·4		—	0·47
1902	2·5		2·7	0·31
1903	1·1		0·96	0·45
1904	0·6		0·59	0·45
1905	0·9		3·9	0·26
1906	1·05		0·6	0·14
1907	1·1		1·9	0·8
1908	0·9		2·6	0·9
1909	1·03		4·0	1·1
1910	—		3·8	0·6
1911	—		3·5	0·7

Apart from the slaughter of the specific groups of tuberculous animals, the preventive work in the Order is not extensive. Under Article 4 of the Order, as the first circular of the Board remarks, "the veterinary inspector will be able to extend his examination to any bovine animals upon the premises that have been associated with a diseased animal, in order that he may at the same time take steps to deal with any other bovine animal which in his opinion presents clinical symptoms of tuberculosis."

In their March 25 circular they repeat this advice, and say the examination should be extended to other bovine animals on the premises, and particularly to all milch cows.

The Order itself, section 4 (1) states that any veterinary examinations to be made are such "as in the opinion of the local authority is necessary." Any preventive work of this nature clearly, therefore, rests with the local authority, and the more active they are the greater the compensation they will have to pay for the first two years.

So far as I have been able to ascertain, most local authorities are looking at the problem from the purely financial standpoint, at any rate in the rural districts.

To work the Order on the best preventive lines, it would be necessary to provide a staff of whole-time veterinary inspectors, who would make it their business to thoroughly examine all herds the milk from which showed the presence of tubercle bacilli, or from which a notification had been received.

It is, as yet, too early to say what will be done in the different counties, but I believe it will be found that in the majority of cases the Order will be worked with a minimum of expense through the local veterinary inspectors now employed in connection with the diagnosis of disease under the Diseases of Animals Acts, and that active preventive work will not be encouraged. This, of course, is a very short-sighted policy, and will largely result in perpetuating the compensation to be paid.

If this forecast is unfortunately realized, I think we must not accept this Order by itself as likely to play any great part in the diminution of bovine tuberculosis in the bulk, and therefore as being most inadequate in itself. I rather look upon this Order as a first instalment, and possibly it goes as far as it is now wise to go, but is incomplete in itself, and must be followed by an extended use of true preventive measures.

These preventive measures must include active educational propaganda, not only to explain to farmers the nature and lines of prevention of tuberculosis in cattle, but also to educate the public to an appreciation of milk free from tubercle bacilli, and should be developed on the lines of assisting the farmer to rear a tuberculosis-free herd.

THE SLAUGHTERING OF ANIMALS: A COMPARISON BETWEEN BRITISH AND FOREIGN METHODS.

BY CAPTAIN CAMPBELL.

Army and Navy Club, London, W.

THERE are two points of view from which we should examine this question in comparing our systems of slaughtering animals for human food with those adopted by other nations. Firstly, there is that of the consumer of the meat, whose health may depend on whether it is cut from the carcase of sound or of unsound animals; secondly, that of the animal, which should certainly be slaughtered as humanely and as expeditiously as possible. This humanity and expedition in slaughtering, desirable as they may be from the point of view of the humanitarian, are indeed just as desirable from that of the consumer of flesh-meats, since, as has been sufficiently proved, an animal that dies with a minimum of suffering gives much sounder meat than one whose system has been poisoned by fever caused by prolonged tortures just previous to death.

At the International Congress held in London it was asserted that slaughter-houses under municipal and State control were in general use in all European countries except Great Britain and Turkey. This means that in all European countries except the two above mentioned you may eat the meat offered to you with absolute confidence that it has been taken from a carcase carefully and thoroughly examined by men trained for this work. These inspectors are in turn supervised by highly qualified veterinary surgeons, who are often men of great intelligence and of high general attainments. The carcase, having been thus carefully examined, is stamped in several places with the official stamp before leaving the slaughter-house for the butcher's shop. If by any chance you should wish to eat meat cut from diseased

animals you can do so, outside of England and Turkey, in Germany. In that last country the flesh of condemned animals is boiled at 250° F. and sold to the very poor under the name of Gemeinde-Fleisch, which you might translate as poor-house meat.

In Great Britain the case is very different. With our multitude of private slaughter-houses it is absolutely impossible that the meat we eat can have been properly inspected; that is to say, it is impossible that each carcase can have been inspected by a properly trained man previous to the removal of the lungs, frænum linguæ and entrails. In Edinburgh this is done. In that city not only is the municipal slaughter-house a most up-to-date institution, but all private slaughter-houses have been abolished. The same state of things prevails in Carlisle, but outside these two cities the complete number of public slaughter-houses at this moment is very small. It was 47 in 1906. These struggle to exist concurrently and in competition with private institutions. How is the meat examined in these towns? Occasionally by a nuisance inspector, who may be an authority on drains, but seldom knows much about meat. Even their inspection is absolutely superficial, generally consisting in a cursory inspection of the clean carcase after the lungs and entrails have been removed. There are veterinary surgeons who claim that they can detect with certitude, by mere visual inspection, whether meat is cut from a sound or unsound animal. Their colleagues, as well trained as themselves, laugh at them, and say that it is impossible to detect disease in meat, except in very advanced stages, without inspecting the primary seats of disease. Thus, from the purely hygienic point of view, it cannot be doubted that our methods of slaughtering compare most unfavourably with those of other countries. The statistics for 1912 of the four Paris slaughter-houses are as follows: Cattle slaughtered, 288,089; rejected for tuberculosis alone (without counting echinococcosis, anthrax, black cancer, enteric, pneumonia, &c.), was 5,424, or a percentage of 1·879, nearly 2 per cent.

It must therefore be evident that in a country like England, where inspection is so perfunctory as to be practically non-existent, at least in most places, this percentage of unsound meat is consumed by the public, and, as a matter of fact, the percentage is probably very much higher since the Paris butchers,

aware of the strictness of the tests their meat will have to undergo, rarely, if ever, send up to the slaughter-house any beast as to whose condition they may entertain any doubt.* There are a few public slaughter-houses, such as the one at Islington, where the meat is thoroughly examined. Even when this has been done the butchers object to having the meat stamped. Surely the consumer has a right to be heard on this matter. There are many who would prefer to eat meat stamped to show it had been examined than to eat that of unknown origin.

So much for the matter of hygiene as far as it is affected by inspection. Let us consider it now from the point of view again of hygiene, but of hygiene as affected by humaner slaughtering. In this respect our neighbours are very nearly as remiss as we are. Abroad, the manner in which the slaughtermen treat animals depends to a large extent on the director of the individual institutions. There are master-butchers who say: "We do not care what the Director of the abattoir may allow; *we* will have our animals humanely slaughtered." But, at any rate, until a couple of years ago there existed on the Continent municipal abattoirs where calves were suspended by a hind leg and left hanging till the slaughterman found it convenient to begin bleeding them. In others from time to time the slaughtermen began to skin the sheep before they were unconscious. Such cruelties it is comparatively easy to prevent on the Continent, for when the director of a public slaughter-house is apprised of their existence he will almost invariably issue regulations to prevent their recurrence.

There can be no doubt that animals slaughtered promptly with humane killers make better meat than those dispatched by other methods. The Berlin experiments of 1906 proved conclusively that animals slaughtered with the Behr pistol bled better than those knocked down with the pole-axe or than those sacrificed with Jewish rites and precautions. Here is another instance proving still more conclusively that animals—at any rate, pigs—that have been stunned beforehand make better meat than those that have been allowed to bleed to death without

* NOTE.—Anyone wishing to study these figures more in detail should write to the Editor of *Lait et Viande*, 40, Rue Murillo, Paris XV, enclosing five francs, when they will receive the annual report of the four abattoirs, and All Paris and the Department of the Seine.

previous stunning. At Laroche, in the Belgian Ardennes, which is the centre of a great trade in hams and pork, until about three years ago the local habit was to kill pigs by cutting their throats in the streets and leaving them gradually to scream themselves to death. The butchers were then persuaded to employ the de Hareng pig-killer, a spike fired from a blank cartridge into the animal's head, thus stunning the animal and letting it, when its throat was subsequently cut, bleed to death in a state of unconsciousness. For three years this state of things continued with most satisfactory results, not only to the visitors, who were no longer tortured by the sounds of the prolonged and diminishing screams of the pigs, but also to the butchers, who discovered that their bacon and hams increased in market value.

So convinced were the butchers of the necessity of stunning their pigs first that, after three years, they, of their own initiative, wrote to Paris for three Masques Brunneau. These instruments are leather masks with bolts inserted into them in such a way that the spike is brought directly over the spot which it is desired to penetrate in order to stun the animal. This instrument, although more efficient than the de Hareng pig-killer, has the single defect that whilst it is being fixed the pig squeals violently although it is in no pain; and this again is open to the objection that the visitors to Laroche dislike the sounds. Nevertheless the butchers prefer the noisy but more effectual instrument; a sure testimonial to the effect that better—and more wholesome—meat is produced by an animal that is not being tortured upon the point of death. The Laroche butchers are now in possession of a captive-bolt pistol.

LITERARY NOTE.

IF Sir Almroth Wright's prophecy—"the physician of the future will be an immunizator"—is true regarding the future attitude of the practitioner of human medicine towards sero-vaccine therapy; it may with equal truth be applied to the practitioner of veterinary medicine. Certainly there is as much scope for its application in the latter profession as in the former, and the announcement by Messrs. Baillière, Tindall and Cox of a new work on "Clinical Bacteriology and Vaccine Therapy for Veterinary Surgeons," by William Scott, F.R.C.V.S., should be welcome news for the veterinarian who is anxious to be "ahead with the times." This work comprises 236 pp., with 12 plates and 37 illustrations in the text, and the price is 7s. 6d. net.

A CYSTICERCUS WITH SIX SUCKERS AND TWO
SEPARATE ROSTELLA.

By R. T. LEIPER, D.Sc., M.B., F.Z.S.

*Wandsworth Research Scholar and Helminthologist at the London School of
Tropical Medicine.*

THE occurrence of six suckers on the head of a tapeworm is not a very unusual abnormality, and is associated with a strobila which is triradiate in transverse section. Certain writers have

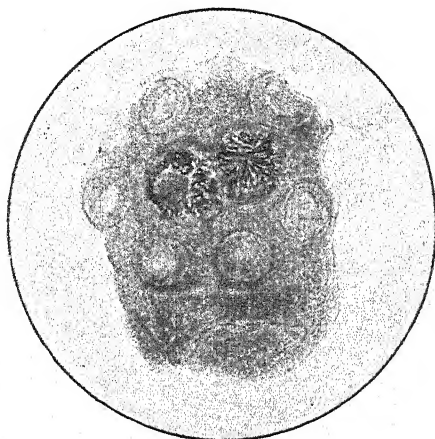


FIG. 1.—Head of *Cysticercus pisiformis*, showing abnormalities described in text.

created new species for such forms. Thus Cobbold has described as *Tænia lophosoma* one of these triradiate abnormalities of *T. saginata*.

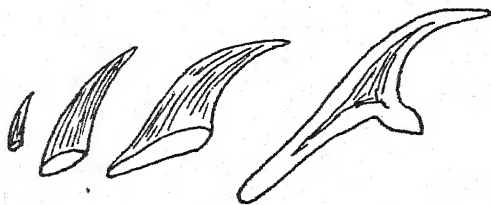


FIG. 2.—Hook development in *Tænia serrata* (after Leuckart).

At the present day, however, their “monstrous” character is practically universally recognized. From a study of the literature of these abnormalities it would appear that the case now

described is unique and throws additional light on the origin of these forms.

A short time ago I received, through my friend, Dr. W. B. Johnson, of the West African Medical Staff, a slide prepared by Dr. H. B. Weir, of St. Thomas's Hospital, London, from a cysticercus from the abdomen of a rabbit. This cysticercus showed a head bearing six well-formed suckers surrounding an area in which were two complete sets of hooks, each surrounding a rostellum. One of the sets showed hooks of typical shape, and



FIG. 3.—Individual hooks from rostellum of abnormal form illustrated in fig. 1.

from these it is possible to state definitely that the cysticercus is *Cysticercus pisiformis*, the larval form of *T. serrata*. The other circle showed only partial development of the individual hook. Indeed, all stages in hook development are illustrated by their individual hooks. A number of these are shown in the accompanying illustration. The normal hook development in *T. serrata* has been described and illustrated by Leuckart, and has shown that the hooks commence as a small globule of cuticle upon which layers are continually deposited internally. A comparison of his figures reproduced in fig. 2, with the drawings of several

of the hooks from this abnormal cysticercus in fig. 3, shows that the curious character of the hooks upon one of the rostellum of this abnormal cysticercus is due to irregular development or partial arrestment in their growth.

The specimen seems to me to show conclusively that those tapeworms which bear six suckers are really double-headed

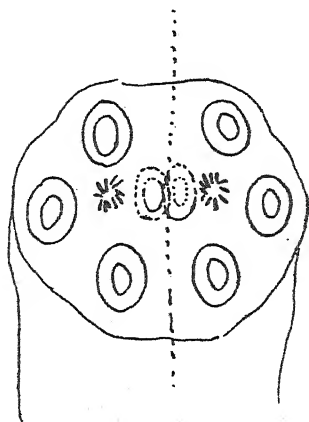


FIG. 4.—Author's explanation of the probable mode of origin of the abnormality.

monstrosities which have lost a contiguous sucker of each head owing to growth pressure. Fig. 4 shows diagrammatically the position of the hypothecated suckers. This view affords a simple explanation for the constant association of triradiate segments with suckers bearing six heads.

Clinical Articles.

A CASE OF PURPURA HÆMORRHAGICA.

By T. G. PALGRAVE, M.R.C.V.S.

Auckland, New Zealand.

Subject.—A five-year-old pony mare.

Previous History.—Had been languid and easily tired for the previous week. The stabling and the care and feeding that the subject had received were excellent.

Symptoms.—Typical except that the head was even more swollen than usual and there were open sores in the flexures of the knees and hocks. The symptoms had developed within twenty-four hours. There was complete anorexia.

Prognosis.—Unfavourable.

Treatment.—

R	Quininæ sulph.	...	...	...	...	3i.
	Iodi	...	...	...	...	gr. xx.
	Potass. iodid.	...	...	...	...	3iss.
	Extr. belladonnæ virid.	...	...	...	...	3ss.
	Mellrs	...	...	...	ad.	3i.
	F. elect. ft.	3xii.				

Sig.—One ounce placed on the back of the tongue or smeared on the inside of the cheeks thrice daily.

R	Potass. chlor.	3ii.
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F. pulv. mitte xii.

Sig.—One powder in the drinking fluid three times daily.

The animal received plenty of fresh milk with eggs beaten up in it and this mixture was used as a vehicle for the chlorate of potash. As an application to the sores on the legs, and to the swollen and tender head, the following was used:—

R	Extr. belladonnæ virid.	...	...	...	...	3iv.
	Tr. arnicæ	...	...	...	...	3ii.
	Glycerini	...	...	...	...	3iii.
	Liq. plumbi. acet.	...	...	...	...	3vi.
	Aquæ	...	...	...	ad	Oii.

Sig.—A little to be applied night and morning.

This treatment was carried out for four days, at the end of

which the chlorate of potash was discontinued. At the end of a further three days the symptoms of purpura had subsided and the following treatment was adopted:—

R	Extr. nucis vomicæ B.P.	...	...	gr. ii.
	Quininæ sulph.	...	...	gr. xxx.
	Ferri sulph. exsicc.	...	...	ʒi.
	Mellis	...	...	ad. ʒss.
F. elect. mitte ʒiv.				

Sig.—ʒss nocte manequē.

By the twelfth day the patient required no further treatment and was eating ravenously. In another week recovery was complete. There were other horses in close contact with the patient until I saw her, but none of these contracted the disease.

It appears an open question as to whether purpura can be classed as an infectious disease. Friedberger and Fröhner and Law class it as such; Trumbower says it is probably infectious; Courtenay says it is not inoculable; Williams states that it is non-contagious; and Hayes says that it is not infectious.

RECTAL INJECTION OF LIQ. FERRI PERCHLOR. FORT. IN THE TREATMENT OF TETANUS.

By L. J. KELLY.

Calcutta.

SINCE my last note I have treated two more horses by this method, with not very encouraging results.

No. 1.

Bay Waler, aged, had no appreciable wound, symptoms only barely in evidence when admitted (August 4, 1913).

Treatment.

Injections three times daily.

August 8, 1913.—Injections discontinued, as symptoms same as when admitted; patient very slightly affected.

August 10.—Injections resumed, as patient's condition aggravated.

August 12.—Injections discontinued, as condition grave, and treatment only causing increased excitement.

August 15.—Went down; received chlor. hy. ʒii per rectum.

August 16.—Up. Went down again that evening. Got up once more.

August 17.—Went down for last time.

The excessive heat, I believe, hastened a fatal termination in this case.

No. 2.

Brown W. gelding, six years admitted (August 6, 1913).

No appreciable wound.

Symptoms marked and becoming aggravated from day to day. Died on 10th.

NEGATIVE RESULTS FROM ARSENIC TREATMENT FOR CANKER.

By JOHN B. YOUNG, F.R.C.V.S.

Braintree, Essex.

A SEVEN-YEAR-OLD cart mare with canker in one hind foot had been treated for this disease by pressure with rolls of tow, but as little progress was made I gave the arsenic treatment a thorough trial, without, however, any good result. I have also at the present time a cart stallion with all four feet affected, which is undergoing the second series of doses without result, excepting that the disease is getting decidedly worse. The treatment in both cases has been pushed to danger point. The doses are exactly similar for each, viz.: Arsenic one day, atoxyl 80 minims the next, continued for twenty-eight days, then one week's rest, and the treatment beginning again. The second period is just drawing to a close and in neither case have there been any toxic symptoms observable.

The atoxyl has been given alternately with arsenic in bolus, the actual doses being 20 gr. on the first and third days; on the fifth, seventh, and ninth days, 30 gr.; on eleventh, thirteenth, and fifteenth days, 45 gr.; and on the seventeenth, nineteenth, twenty-first, twenty-third, twenty-fifth, and twenty-seventh days a dram for each dose.

The atoxyl has been given hypodermically on each of the intervening days in doses of 80 minims.

For local treatment I have tried caustics, actual cautery, and pressure.

The mare has been turned out on a dry pasture during the daytime and the stallion is kept in a loose box and ploughing on soft land.

TWO INTERESTING CLINICAL CASES OF BRAIN
TUBERCULOSIS.

By DR. BERGSCHICKER.
of Berlin.

A SIX-MONTHS-OLD heifer was operated on for entropium of the upper eyelid with consecutive chronic keratitis. The sutures were removed eight days afterwards, the wound having healed *per primam*. The keratitis appeared to be comprised in the healing. Eight weeks later I found the animal stiff in its whole body and its head pressed against the wall. The interior of the somewhat cleared up cornea of the eye operated on was studded with nodules of undoubted tuberculous origin.

Diagnosis.—Generalized tuberculosis, especially of the eye and meninges.

Autopsy disclosed this: The organs of the well-nourished animal were free from tuberculosis, only the spleen showed isolated tuberculous nodules. In the lungs and mesenteric glands there were pea-sized nodules in moderate quantity. The whole eye in all its covering was permeated with lentil-sized tubercles similar to those studding the meninges. The brain substance was quite free from tubercles. It is probable that the entropium and vascularization were secondary to the tuberculous trouble.

A ten-year-old cow had given birth to a living calf ten weeks before her time. The after-birth was retained, but the general condition of the animal was not much affected. Fourteen days after the birth the cow lay apathetically with her head turned round on her neck. The owner tried to get her up, but she exhibited clonic-tonic muscular spasms when risen. In this condition I found the animal ten minutes after the first attack. Heart-beats and breathing accelerated. Temperature normal. Sensorium undisturbed. The spasms became more violent, no special group of muscles being affected; the pauses between the attacks become shorter.

Diagnosis.—Open-minded; epilepsy? brain tumour? cerebral hæmorrhage?

The animal was slaughtered after an hour. Black blood squirted in two wide bows from the neck vessels. The muscular contractions continued several minutes after the bleeding.

On *post-mortem* there was sapræmic metritis of the serous covering of the chest and abdomen, together with a moderate

number of large caseated tubercles in the principal organs, and in the lower portion of the diaphragmatic pleura a very large tuberculous tumour. One mediastinal gland showed a tuberculous nodule.

The remaining organs were free from tuberculosis, only in the cerebellum there was a caseated pea-sized tuberculous mass which pressed on the medullary body.—*Berliner tierärzt. Wöch.*

BOVINE COCCIDIOSIS IN CORNWALL.

By R. H. SMYTHE, M.R.C.V.S.

Redruth.

ALTHOUGH bovine coccidiosis has been regarded as of somewhat rare occurrence in this country, the writer's experience proves that at least in Cornwall, and judging from the reports of other veterinary surgeons in Devon also, coccidiosis is of comparatively common occurrence. During the last summer a large number of outbreaks have occurred in this practice, irrespective of any particular district. Usually several animals are affected at one time, but occasionally only one of a herd.

Symptoms.—The disease occurs in two forms, an acute type affecting bovines from six to eighteen months, and a chronic type affecting older animals.

Acute Type.—The first evidence of the disease is the passage of blood in small clots, which are easily visible upon the surface of apparently normal fæces.

As the disease progresses the fæces become liquid, contain larger clots of blood, are dark in colour, and smell badly. There is a good deal of straining, and for several minutes after defæcation the animal stands with its tail cocked and may pass a little blood at intervals.

Up to this time there are few or no other symptoms. The appetite is usually maintained, and the animal looks fresh and well.

At a later stage the fæces consist of slimy, stringy mucus containing small clots and uncoagulated blood. More than half the contents of the fæces at this time may be pure blood.

The appetite now entirely disappears, the animal becomes weak and totters, and if not treated soon dies. Often attacks of colic appear.

In some cases recovery takes place naturally at the second stage.

Chronic Type.—This occurs in old animals, and we have experienced some doubt as to whether coccidia are actually the cause of the disease, but judging from the number present in the fæces and the absence of lesions of other disease we must accept them for the present as the predominant factor.

This type occurs chiefly in dairy cows, and seldom before the sixth calf. The symptoms are identical with those of Johne's disease, and it is only possible while the animal is alive to distinguish the two diseases microscopically. Avian tuberculin might prove helpful, as it is possible for the two conditions to occur simultaneously.

In brief, diarrhoea occurs at intervals alternated with normal spells of perhaps a month. The animal looks cheerful, eats fairly well, but becomes emaciated and hide-bound. We have never observed udder lesions as described by some Continental practitioners.

Diagnosis.—The microscope reveals large numbers of oval coccidia present in the fæces in both types of the disease, and as a rule from five to twenty coccidia may be observed in one field of the microscope. In addition, in the acute type blood corpuscles are present in large numbers, and in both types putrefactive bacteria are very much in evidence.

Tuberculin and avian tuberculin should be used in the chronic type to decide whether coccidia are the sole cause of the symptoms.

Post-mortem Lesions.—As yet we have had no opportunity to make a *post-mortem* examination in cases of the acute type.

In the chronic type the *post-mortem* lesions are very peculiar. Instead of the proliferation of connective tissue, and consequent thickening of the lumen of the intestine, the walls of the bowels were found to be very thin and almost parchment-like, while the mesenteric glands were enlarged and oedematous. Coccidia could be found in large numbers.

Treatment.—Internal administration of liq. ferri perchlor., ol. tereb., dilute acids, and antiseptics as lysol and creosote appeared of little avail.

Acting on the advice of Professor Wooldridge we made great use of catechu, which appears to have a specific action on coccidia by virtue of the tannin it contains.

Although we have treated a large number of cases of the acute type in yearlings, since using the following prescription we have had no deaths:—

R	Pulv. catechu ...	...	...	...	5ii
	Pulv. asafœtidæ ...	...	...	...	5i
	Tct. opii. ...	...	...	...	5ii
	Creosoti ...	...	...	...	5i
	Aqua ad ...	...	...	...	Oss.

M. ft. haust.

Sig. The whole to be given in one pint of cold boiled wheaten flour gruel, and repeated twice daily.

Hypodermic injections of adrenalin control the hæmorrhages.*

We believe it possible that coccidiosis may be much more common in cattle in England than has generally been supposed, and careful examination, particularly microscopical examination of the fæces, may reveal the disease in other parts of the country.

RARE CAUSE OF UDDER DISEASE.

By LUDWIG KLEIN.

Pennsylvania.

KLEIN, writing in the *American Veterinary Review*, states that a large dairy herd commenced to give milk which contained little flocculi and white jelly-like clumps. At first only a few cows were affected, but the number soon increased until 90 per cent. of the milking animals showed the above-named changes in the consistency of the milk. Finally the milk was so considerably affected with clumps and flocculi that it could no longer be passed through the strainer.

In some cases this condition disappeared after two or three days; but as a rule the evil continued and the flakes increased in size and number.

In a few cows one quarter of the udder only secreted the changed milk, in others two, three, and even four quarters gave abnormal milk. Since the opening of the teats of the altered

* In the treatment of the chronic and more advanced type we have not been so successful. Best results have been obtained by the use of copper sulphate, but the diarrhœa is liable to recur, and there is often no marked improvement in condition. Thymol is also useful.

quarters were blocked in many cases, milking was performed with difficulty. Frequently this condition announced the first signs of commencing change in the milk. As a cause the food was first suspected, but repeated changes of food had no influence on the complaint. On examination Klein found forty-eight cows affected. These cows, like the other animals of the herd, were in good condition and showed no pronounced symptoms of disease. No swelling of the udder was present, nor did the cows show pain on pressure of that organ; with the exception of one cow, which had very hot teats, none of the attacked quarters showed increased warmth. But in a few cases there was a red ring round about the opening of the teat-canal which pointed to inflammation and swelling of the mucosa. In individual cases the teat opening was closed by a scab of dried exudate or milk, in others the milk stream divided or deviated from the normal direction; there were also signs of catarrh of the mucosa of the teat-canal or milk cistern. The changes were put down to catarrhal mastitis and streptococci.

Microscopical and bacteriological examination, however, showed the presence of streptococci in all cases, whilst at the same time the number of bacteria were smaller than usual. After investigation and experiment the author came to the conclusion that he had to deal with a slimy catarrh which depended chiefly on an irritability of the normal cell activity, also mucous secretion in the presence of few leucocytes.—*Deutsch. tierärztl. Woch.*

TWO FELINE CASES.

I—OTORRHEA.

Subject.—A white short-haired male cat.

History.—Discharge noticed for the first time on the previous day.

Symptoms.—Typical; both ears affected.

Treatment.—A powder composed of one part of salol to seven parts of boracic acid was placed in the ears twice daily for three days, and once daily for a further four days, at the end of which time recovery was complete.

I have found salol preferable to iodoform in these cases as more speedy cures result. Further, salol has not the offensive

odour of iodoform, and is therefore more suited to household pets, as this cat was.

II—ACNE.

Subject.—A blue female Persian cat.

History.—Had been affected for about three weeks. Owner had tried various nostrums, but without effect.

Prognosis.—Doubtful, on account of the time the disease had been in existence.

Symptoms.—Typical; the disease appeared on the top of the head, upper part of the face, on one elbow, on the outside of one thigh, and on one side of the thorax. The whole of the top of the head and the upper part of the face were covered with it; the patch on the elbow was the size of a threepenny bit; the patch on the thigh was about an inch and a half by half an inch; and the patch on the thorax about two inches by one; all these patches were irregular in shape.

Treatment.

R Sulphur iodic.

Glycerin āā ʒi

Camphor ʒss

Thymol gr. v

Adipis benzoat. ad. ʒi

F. ungt. mitte ʒii.

Sig. Apply once daily.

R Liq. arsen. hydrochlor. mss

Potass. tart gr. viiss

Ac. boric gr. i

Aquæ ad. ʒi

F. mist. mitte ʒiv.

Sig. ʒi ter in die cum cib.

No specific directions as to diet except that it be nourishing.

In three weeks recovery was complete; the medicine for internal use was discontinued at the end of the second week. The owner was most assiduous in carrying out the treatment, but was somewhat concerned about the discoloration of the fur by the iodide of sulphur; however, a solution of iodide of potassium soon removed all that.

PARASITIC OTITIS OF THE DOG AND CAT.

BY Professors HEBRANT AND ANTOINE.

THE authors consider that parasitic otitis occurs very frequently under the synonyms of *sarcoptes cynotis*, *symbiotes auricularum*, *chorioptes ecaudatus* (Pailles), *otodectes cynotis* (Geddoelst), *dermatophagus auricularis* (Marek). As well as cats, hounds and sporting dogs are frequently affected. The symptoms are similar to those of ordinary aural catarrh. The animal inclines the head sideways, shakes frequently, rubs the ears on the ground and walls, scratches the external ear. Itching is more or less pronounced, arises almost always in cats in the occipito-temporal region inside the shell of the ear; as a result of the scratching skin lesions arise commencing with loss of hair and leading to bleeding and scabby wounds. These external circumscribed injuries are almost pathognomic and on their presence the practitioner should always examine the interior of the ear. In this examination one finds copious brown ear wax; in severe chronic cases it softens and emits a sourish, unpleasant smell. Inflammation of the middle and internal ear may also arise with symptoms of brain irritability (eclampsia of hounds). Diagnosis is easy. By microscopic examination of some ear wax, which has been mixed with a few drops of 10 per cent. of potash solution, the parasites may be discerned. The treatment of parasitic otitis is easier than that of idiopathic catarrh of the ear. After killing the parasites cure easily occurs. As a result of the contagious character of the complaint certain prophylactic measures are indicated: isolation of the ailing animals and disinfection of the locality. Curative treatment comprises all parasiticides. Cleansing with lukewarm, soapy water, 2 per cent. cresyl solution, 1 per cent. liver of sulphur solution, 2 per cent. alcoholic salicylic acid solution, alcoholic naphthol solution and various antiseptic dusting powders.

The most gratifying results obtained by the two authors have been accomplished with two preparations, glycerine of iodine (glycerine 100, tincture of iodine 10), and with carbolized oil (linseed oil 100, liquid carbolic acid 1).—*Oesterreichische Woch. fur. Tierheilk.*

EXPERIMENTS IN THE TREATMENT OF ASCITIC
AND PERICARDIAL EFFUSIONS OF THE DOG
BY EXPLORATORY LAPAROTOMY.

PRELIMINARY NOTE BY PROFESSOR COQUOT.

RESEARCHES in human surgery by Tahua and Morison in vascular cirrhosis—atrophic cirrhosis—have had for their object the removal of the effusions by forming anastomosis between the epiploic veins (portal system) and the veins of the abdominal wall (cava system) and deviating the portal into the cava circulation. Bearing this in mind and noting also the researches of Kischenski relative to the mode of action of laparotomy in tuberculous peritonitis we have tried to practise exploratory laparotomy as curative treatment in tuberculous dogs presenting ascitic and pericardial effusions.

Two dogs have been operated on, one on March 10 and the other on May 10.

At the time of writing these lines the effusions have not recurred. The very encouraging results we have obtained have decided us to pursue the study of this question. With the concurrence of Messieurs Lebasque, Chief of the Clinique, and Sirvonnet, ex-Preparator at the Research Laboratory, we propose to publish shortly a collaborated work on the researches we have undertaken, and we hope to be able to report precise indications from both the pathogenic and therapeutical point of view.

(The translator has recently performed laparotomy in a bull bitch after evacuation of the peritoneal fluid and swabbed the abdominal cavity with sterile liquid paraffin with a view to checking further exudation. It is possible that a combination of paraffin treatment in abdominal dropsy (see pp. 435 and 436 VETERINARY JOURNAL, 1912), and the method mentioned herein might produce better results than one treatment alone).—*Recueil de Médecine Vétérinaire*.

Reviews.

Special Pathology and Therapeutics of the Diseases of Domestic Animals. By Dr. Franz Hutyra and Dr. Josef Marek (Professors in the Royal Veterinary College at Buda Pesth). Authorized translation. Edited by Dr. John Mobler and Dr. Adolph Eichorn (U.S.A. Bureau of Animal Industry). Vol. i, 1133 pp. 198 illustrations and 10 plates. Vol. ii, 1017 pp., 163 illustrations and 5 plates. Published by Messrs. Baillière, Tindall and Cox, London. Price of each volume 3rs. 6d. net.

The year 1913 has been especially rich in veterinary text-books, and the present one is of especial value as it embodies all the up-to-date work in veterinary medicine, not only in Europe, but also in America. In addition to Drs. Mobler and Eichorn, the Editors, the work received aid both in translation and original comments from Drs. Paul Fischer, Achard and Hertzog, of America, and Messrs. Leslie Sheather Molest, B.Sc., and G. Mayall Molest, of England.

The amount of ground covered and the labour expended both by authors and translators is stupendous, and the views expressed on all the subjects dealt with are broad-minded and complete.

The translation is made from the third edition, and the second edition met with such a welcome that it had become exhausted within two years, a proof of its appreciation by our continental colleagues.

Both volumes are well illustrated and a number of the plates are coloured.

Vol. I deals with the infectious diseases, and in the list, which is too lengthy to take in detail, the history, modes of infection, methods of microscopical research, symptoms, diagnosis, prognosis, prophylactic and curative treatments, and bacteriological methods of culture, are all fully entered into.

Where vaccines have been found of value their details of preparation and use are fully given, and full credit is given to the discoveries of treatments which have proved to be of value. Anthrax, swine erysipelas, blackleg, the various septicæmias, influenza, distemper, purpura, rinderpest, fowl-pest, African horse sickness, to mention only a few names, and hosts of others are dealt with with thoroughness. To praise the book too highly would be impossible, and to all medical men, as well as veterinarians, it is a fund of information.

Every veterinary surgeon should have it on his bookshelf as

a work of reference, and it is a text-book which cannot help but to give him up-to-date hints when the latest information is sought. Its price is perhaps a little high for a veterinary text-book, but the work is so complete, and so well arranged, that the purchaser will soon find ample evidence that the money has been well spent and will be repaid with high interest.

The printing is clear and easily readable and the publishers have done their work as satisfactorily as the authors. Altogether it is one of the best books which have ever been issued to the veterinary profession.

**Annual Report of the Veterinary Pathological Laboratory,
Nairobi, British East Africa, 1911-1912.**

This Report, addressed to the Acting Chief Veterinary Officer, Nairobi, by Mr. R. Eustace Montgomery, Veterinary Pathologist, is a valuable document dealing with the present work and future possibilities in the management of live-stock in British East Africa. It is a record such as this which must convince the reader of the essentially civilizing and imperial work which is being done by modest scientists beyond the borders of civilization. In the laboratory alone, a staff of some half-dozen men have, during the year under review in the Report, dealt with no less than 840 head of cattle, 230 sheep, 6 goats, 145 pigs, and 18 equines. East Coast fever, rinderpest, gall-sickness, trypanosomiasis, piroplasmiasis, are among the diseases considered in the Report, which we cordially commend to the notice of all workers in tropical veterinary medicine. It can be obtained from Waterlow and Sons, Ltd., London Wall, E.C., and is issued under the authority of the Department of Agriculture, British East Africa.

**Annual Report of the Punjab Veterinary College, Civil Veterinary
Department, and the Government Cattle Farm, Hissar, 1912-
1913.**

This is another valuable document as to the work being done by the members of our profession in another part of the Empire. We learn therefrom that the Hissar Cattle Farm is now under the control and management of the Punjab Government, though we regret to hear that the expenditure on the farm has been largely in excess of the receipts. We would suggest, however, to those in authority that the value of work such as is being conducted at Hissar, cannot be judged merely from the pecuniary point of view. Colonel H. T. Pease, C.I.E., continues to be Principal of the Punjab Veterinary College, to which 57 students formed the first year's class, 59 the second, and 66 the third year's

classes. The work being accomplished both in breeding and experimental medicine under the auspices of the Civil Veterinary Department, of which Lieut.-Colonel Farmer is Chief Superintendent, seems to be excellent, and well deserves the publicly expressed appreciation of the Lieutenant-Governor, and his opinion recorded in these pages that the Department continues to maintain its high level of efficiency. The Report is on sale at Constable and Co.'s, 10, Orange Street, Leicester Square, W.C., or through H. S. King and Co., 65, Cornhill, E.C.

Memoirs of the Department of Agriculture in India. By Major J. D. E. Holmes, M.A., D.Sc., I.C.V.D.

We have likewise received from the Imperial Department of Agriculture in India a record of some cases of surra treated in the field and in the laboratory in the Autumn of 1911 by Major Holmes. This brochure is part of the Veterinary Series and was published in August last. The Report consists of a series of very valuable clinical tables, including some important experimental treatment carried out by Captain O'Kelly at Bareilly on thirteen mules from the Transport Corps. The tables, including the record of treatment, deserve the careful study of those of our readers who may be called on especially to deal with surra. This brochure can be obtained at Messrs. W. Thacker and Co.'s, 2, Creed Lane, London, E.C.

The Philippine Agricultural Review, Veterinary Number.

This issue of a very valuable publication issued at Manila is a tribute to the splendid work being accomplished by the American authorities in the Philippines. It is conducted by Dr. F. W. Taylor, and includes a record of the College of Veterinary Science in the Philippine University, a valuable article on the "Surra-conveying Fly of the Philippines," by Dr. M. Bruin Mitzmain; "Some Observations on the Clinical Diagnosis of Glanders," by Dr. G. H. Schultz; and an article on "Kidney-worm Infestation of Swine," by Dr. Boynton. There are some admirable illustrations in the review.

Correspondence.

THE PATENT MEDICINE TRADE.

To the Editor of THE VETERINARY JOURNAL.

SIR,—For some time past we have been, in collaboration with several veterinarians and agriculturists, inquiring into the composition of certain patent medicines, which are, as is well known,

vaunted as cures for every (or nearly every) ailment. Yet in many instances the administration of such preparations has fallen under grave suspicion of causing harmful results or even death.

We know that there is a widespread desire among members of the profession for more knowledge as to the ingredients, value, and suitability of these remedies, and we have at the present moment several analyses. Before publishing these we should, however, like to extend our inquiries, and with this view we shall be glad if our professional colleagues will send unopened bottles or packets of the "quack" drinks, which in their experience are most commonly used in their districts.

Specimens may be sent either to the Chemical Laboratory, Royal Veterinary College, Camden Town, N.W., or to 165, Church Street, Kensington, W.

We are, Sir, yours faithfully,
 FREDERICK HOBDAY,
 G. D. LANDER.

Letters and Communications, &c.

Captain Williams; Mr. Motton; Mr. Mitchell; Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixon; Mr. W. M. Scott; Mr. G. Mayall; Captain Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Captain Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Veterinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine; Philippine Agricultural Review; Memoirs of the Department of Agriculture in India; Annual Report Punjab Veterinary College, C.V.D.; Annual Report Veterinary Pathological Laboratory, Nairobi.

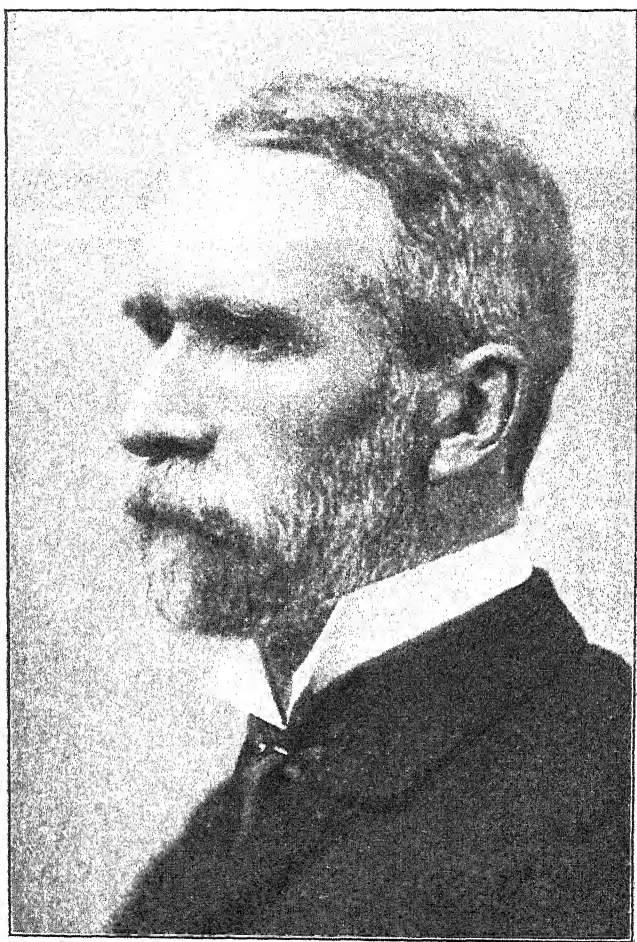
NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

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Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.



THE LATE EDWARD NETTLESHIP, F.R.S., F.R.C.S. ENG.,
M.R.C.V.S.

THE VETERINARY JOURNAL

DECEMBER, 1913.

THE LATE EDWARD NETTLESHIP, F.R.S., F.R.C.S.Eng.,
M.R.C.V.S.

In the world of science there have been very few more earnest workers than Edward Nettleship, and to his labours we owe much which is known at the present day on the subject of heredity, especially in connection with diseases and variations of the eyes.

Born in 1845, he made his first animal studies at the Royal Agricultural College, Cirencester, and took this diploma in 1863, subsequently lecturing there from 1867-1868 on veterinary science. He then commenced the study of medicine at King's College, and shortly afterwards attended lectures at the Royal Veterinary College in Camden Town, graduating as M.R.C.V.S. in 1867 and M.R.C.S.Eng. in 1868. Deciding to take up human medicine and to specialize in ophthalmology, he obtained the appointment of Clinical Assistant to Dr. Jonathan Hutchinson, at Moorfields Hospital, and in 1870 graduated F.R.C.S. His great skill in ophthalmic work soon got him a wide consulting practice, and in 1875 Mr. Nettleship was called upon to make a report to the Government on the subject of ophthalmia in pauper schools; whilst in 1910 he was appointed a member of the Government's Departmental Committee on Sight-tests. He held at various times the positions of Consulting Ophthalmic Surgeon to St. Thomas's Hospital, the Royal London Ophthalmic Hospital, and the Hospital for Sick Children in Great Ormond Street. Probably his most noted patient was Mr. Gladstone, upon whom he successfully operated for cataract.

His scientific work, shown in writings and in research, brought for him, in 1912, the F.R.S., as in that year the Royal Society conferred this honour upon him. In veterinary work, pure and simple, his name was not much known, but in the study of albinism in dogs he had made many experimental observations, and a paper on "Blindness from Optic Neuritis in Cattle" was contributed to the columns of the VETERINARY JOURNAL only as recently as October last.

Reserved and retiring in disposition, it was only when one gained his friendship and confidence that the true friendliness of his character was brought out, and had he lived there is no doubt that the profession would have heard more of him, as several contributions of great scientific interest had been promised.

Although out of active practice his mind was ever working to elucidate the mysteries of life, and when he had attained to such eminence in science and human medicine he many times freely acknowledged the help which a knowledge of the animal world, obtained through his veterinary diploma, had given him, and the readiness with which he gave support to the forthcoming International Veterinary Congress showed that he still had practical sympathy with his veterinary colleagues.

Editorial.

"OVERSTOCKING" COWS' UDDERS. IS IT CRUEL?

By "overstocking" cows' udders, as doubtless most of our readers are well aware, is meant the practice carried on by some cattle dealers and others of leaving milch cattle unmilked for a longer period than usual, in order that they may have the appearance of being heavy milkers. Recently the Royal Society for the Prevention of Cruelty to Animals has prosecuted several owners, against whom it was alleged that they had cruelly ill-treated cattle by allowing them to be overstocked. In one case the magistrates convicted, but their decision was quashed on an appeal to Quarter Sessions, the Recorder declining to state a case. In another case the magistrate found that there was "overstocking" and that the cow suffered pain, but because it was an old-established custom in the district they dismissed the summons. In this instance the case was taken to the High Court (King's Bench Division), and, after a hearing by three judges, the case was unanimously remitted to the justices with a direction to convict. It will thus be observed that the legal aspect of the question is somewhat unsatisfactory.

For the present, however, we can leave that question to the specialists in law, and turn to that aspect of the case which more closely concerns us as veterinary surgeons, namely, as to whether the practice is either cruel or detrimental in any way to the cow. There should really be no indecision in the matter.

and no two opposite opinions, at any rate so far as freshly calved cows are concerned; yet when such cases are brought into court one invariably finds veterinary surgeons on both sides, some giving the opinion that there is pain and suffering produced, while others state that there is no pain and therefore there can be no cruelty in the practice.

There can be no difference of opinion as to the primary facts of the case. A cow in full milk is usually milked at fairly regular intervals if it is desired to get the best milk yields. It is not always possible, however, to divide the day into two equal periods of twelve hours owing to the times required to get the milk to its market, and probably a ten or eleven hour day and a fourteen or thirteen hour night are more customary. Beyond that time, especially in heavy milkers and newly calved cows, the udder becomes somewhat distended and the cow certainly uncomfortable. If that condition is continued, the discomfort just as certainly becomes pain. It is true that no arbitrary line can be drawn as to when that discomfort becomes pain, but such symptoms as paddling of the hind feet, a hard or distended udder, blowing respirations, and grunting, assuredly indicate pain in a cow that has gone far beyond her usual time of milking. In our opinion no freshly calved cow should be allowed to go longer than fourteen hours between milkings, and, if possible, the period should not exceed twelve hours. Moreover, irregularity of the intervals between milking prejudicially affects the milking capacity, and if "overstocking" is carried on very far it may even produce mammitis, in either case reacting inimically to the best interests of the dairyman.

Then, is it necessary? Practical dairymen and judges of milch cows are unanimous in their view that it is not possible to fairly judge a cow's udder if she has been recently milked and that she is best judged ten or twelve hours after milking; that is to say, the udder must be reasonably "stocked." We have never yet heard of one such judge saying it is necessary to "overstock" the udder to judge it. Consequently, we are of opinion that if it is intended to send a cow to market without milking her out that morning, she should at any rate be milked late on the previous evening and not in the middle of the afternoon, leaving a period of eighteen or twenty hours before she is next milked after being sold. The long interval can and should be avoided.

"Overstocking," then, must be regarded as painful and unnecessary, and inimical to the best interests of the cow and the farmer. It is a practice that should certainly be discontinued.

THE HUNTING MEMORIAL FUND.

IN our last month's issue we published an obituary notice of Mr. William Hunting, and in that we gave sufficient evidence of the fact that his earnestness had done much to further the advancement of the profession.

By the wish of a number of friends it is proposed to establish a Memorial Fund, the subscriptions to which shall be expended in some way worthy of perpetuating his name; perhaps, in the form of an annual lecture, to be delivered in some veterinary school; perhaps, in the form of a bursary or scholarship for the benefit of the student.

A Committee has been formed to carry out this object and a report of the first meeting will be found on a later page. We have every confidence in saying that the object will commend itself to our readers and receive every support from the profession.

MILK PRODUCTION OF THE GOAT.

DR. WEBER comes to the following conclusions from observations conducted at the Dresden College:—

(1) The milk production of a goat during one lactation period reaches an average of 500 kg. (about 110 gallons).

(2) The average fat content of goat's milk is from 2.6 to 2.7 per cent.

(3) Change in feeding has no marked influence on the quantity and fat contents of goat's milk. (Green feeding and grazing did not come into the scope of the experiments.)

(4) In milk capacity the Swiss goat has nothing to be preferred to the Saxon Erzgebirge goat.

(5) With the advance of lactation the quantity of milk decreases, as with the cow, but the fat content does not ascend regularly, but moves in irregular variations up and down.

(6) In goats also milking qualities are an individual peculiarity which by much concentrated diet can only be imperceptibly influenced.

(7) A goat gives about ten times its body weight in milk.

(8) The duration of the lactation period in goats is about ten months.

(9) In most police milk regulations at least a fat content of 2.7 to 3 per cent. must be reached, but in the case of goat's milk it may be reduced to 1.7 to 2 per cent.—*Deutsche tierärzt. Woch.*

General Articles.

FOOT-AND-MOUTH DISEASE IN MAN—APHTHOUS FEVER.*

By C. M. O'BRIEN, M.D., L.R.C.P.

Physician to City Hospital for Diseases of Skin and Cancer, Dublin; Honorary Member of the Dermatological Society of France; Fellow of the Medical Society of London.

AMIDST the grey routine of my daily grind it has ever been my wont to bring under notice of the profession things within my purview which appeared to me of interest to it. I am happy in the belief that my humble efforts in this respect have been fully justified by reason of the full, free and unfettered discussion which they invoked on each occasion. Actuated by this spirit, I bring the report of this case before you to-night, in order to place on record notes of a cutaneous affection which falls to the lot of few to meet.

The epidemic of foot-and-mouth disease in cattle which swept this land from shore to shore in 1912, and which created such financial havoc and black despair amongst a large portion of our population enables me to relate my only experience of this malady as it affects mankind. Although the statement at first sight may seem somewhat paradoxical, it is, nevertheless, true to say that perhaps the most interesting feature associated with foot-and-mouth disease in man is the paucity of its bacteriological literature, and in search of this literature the point above all others which impressed me most is, that in an age like the present, of modernism and medical research, how little, after all, we are helped towards a positive diagnosis in this as in many other cutaneous affections by other than those senses which are the heritage common to all, and which served Æsculapius in such good stead long before the death of Grecian priest-craft and even the dawn of medical history. It would appear that the first reliable record of foot-and-mouth disease in man was made in 1695, by Valentin, of Hesse. In 1834 three Continental veterinary surgeons named Hertwig, Mann, and Villain, while investigating the disease in cattle, wished to know if it were communicable to human beings, and as an experiment voluntarily

* A paper read before the Section of Medicine, Royal Academy of Medicine in Ireland, January 31, 1913. Reprinted from the *Medical Press and Circular*.

drank a quart each of the milk from a cow suffering from the infection. On the second day Hertwig suffered from fever, headache, and itching of the hands and fingers. Five days later vesicles appeared on the fingers, hands, tongue, cheek, and lips. Mann and Villain developed vesicles on the buccal mucosa. In 1896, during an outbreak of foot-and-mouth disease in Berlin, several instances of its spread to man were reported, and unhesitatingly confirmed by Virchow, after an investigation which for minuteness and completeness of detail could not fail to influence the most sceptical.

A child fed on milk of diseased cows had chill and fever with gastric disturbances, and later an eruption of vesicles on lips, tongue, and the clefts between fingers and toes. A shepherd infected himself by holding in his mouth the knife with which he had pared the diseased feet of sheep. In 1883, Sir Charles Cameron, C.B., M.D., Chief Medical Officer of Health for Dublin, during the epidemic in this country of foot-and-mouth disease in cattle had under his care a man who contracted the disease through direct inoculation. He presented a rash on both feet and hands which developed into vesicles later. The throat, lips, and mucous membranes had also distinct vesicles. About the same time Sir Clifford Allbutt saw the buccal eruption in three children during an epidemic of foot-and-mouth disease in Yorkshire.

Cases of infection through butter made from infected milk are on record, of which the following is a good illustration:—

On November 18, 1890, a veterinary student in Berlin had sent to him by his brother-in-law a packet of fresh butter made from the milk of cows suffering from foot-and-mouth disease. On the following day he ate some of the butter for the first time. During the next night he was feverish, and on the morning of the 20th he found his lower lip red, swollen, and covered with vesicles which were itchy. Later the vesicles spread to the buccal mucosa.

Similarly, Schneider gives cases caused by infected cheese, and Friedberger cases from virulent buttermilk. Instances of infection by inoculation have been observed, of which the following is perhaps the most interesting and instructive, and as it presents many points in its clinical history which resemble the subject of my paper, I am induced to give full details as they appear in the *Veterinarian*, 1831:—

The patient was a farmer who had injured one of his fingers in drenching a cow suffering from foot-and-mouth disease. The wound took on an unhealthy action, and after some days he was taken ill with a cold shivering fit. This occurred in the evening, and by the following morning the cold fit had been succeeded by fever. Twenty-four hours later vesicles formed on the gums and tongue.

Instances of transmission of the virus of foot-and-mouth disease from lower animals to man both by inoculation and otherwise could be further multiplied if time allowed or necessity demanded, but I feel convinced there are few if any serious thinkers amongst us to-day who entertain much doubt upon this particular point. For myself I candidly own that if at any time in my career I entertained the least doubt as to the transmission of foot-and-mouth disease from lower animals to man that doubt is dissipated for all time by the undermentioned case, notes of which *tout ensemble* constitute a clinical picture not easily counterfeited.

Case.—G. J. B. consulted me in my study on August 12, 1912. He now permits me to publish the following:—

Veterinary Inspector, Irish Agricultural Department, M.R.C.V.S., aged 35, married. Family history—unimportant. Personal history—of temperate habits; had scarlet fever at the age of 10. Otherwise he always enjoyed very good health. On July 9, 1912, while in discharge of his duty as Veterinary Inspector to the Irish Agricultural Department, he was bitten by a sheep on the index finger of the left hand while examining the beast for suspected foot-and-mouth disease on an infected farm at Swords, Co. Dublin. Having applied an antiseptic dressing to the wounded finger and used a thin rubber finger-stall as an additional protection, he continued his daily examinations without intermission, not anticipating any serious results. About three weeks later the wound appeared to form an abscess, to which the patient applied an abscess knife, with every antiseptic precaution. There was no pus found; the local pain and tenderness continued and the wound did not heal. As his colleagues of the department were all fully occupied coping with the outbreak, and as his services as a result were badly needed, he declined to lie up. On the morning of August 11, redness and swelling appeared on both hands and fingers, accompanied by great itching of the parts,

with a few small raised white swellings like little lumps under the skin, especially round the nails. By night-time slight itching of the upper part of both feet, accompanied by a sensation of pin pricks in the soles, which became more pronounced when walking. He also complained of feeling out of sorts for a day or two previously. Bowels were confined; slight headache was present, with loss of appetite, and some colicky pains.

Having received the foregoing particulars I proceeded to examine the patient. A thick, well set up man, about 5 ft. 6 in. in height, of exceptionally good muscular development. Rather younger in appearance than stated age. The fingers and dorsal aspect of both hands were markedly swollen and covered over with a dull, reddish, raised rash, which stopped short somewhat abruptly an inch above the wrists. Examining closely, immature vesicles were observed here and there over the surface of the rash, more especially in the clefts between the fingers and immediately above and around the finger nails. A sensation of great itching over this region was complained of. On removing the dressing of the injured finger, the edge of the wound gaped, and although no pus exuded on pressure, nevertheless it exhibited few signs of healing. There was no perceptible involvement of the lymphatic glands. Examination of the throat exhibited congestion of the fauces with some vesicles. Vesicles were also observable on the inside of the lips, gums, and side of the tongue. The latter appeared swollen and tender. Mastication, deglutition, and talking were painful. The saliva was increased and the voice less distinct than normal. The temperature registered in the mouth was just 100° F., and never exceeded this during the entire illness. The urine was high-coloured, of acid reaction, specific gravity 1020, sugar and albumin absent. The heart, lungs, and other organs appeared quite normal. The patient complained of increasing itchiness over the dorsal aspects of both feet, and excepting a slight redness above and inside both knees, no rash was perceptible on lower extremities at this stage. But there was a sensation of sharp pin-pricks over the soles of both feet, rendering locomotion troublesome. Knee-jerks were normal, ankle-clonus present.

Condition of patient on August 13, 9.30 a.m.—Excepting the slight rash on inside of thighs, which has now entirely disappeared, all the previous symptoms are more pronounced. Vesicles

fully formed about the size of peas on lips, tongue, and fauces. Saliva trickles from the mouth. Swallowing and speaking more painful, while in addition the dorsal aspects of both feet present a rash precisely similar to that previously described on hands, the rash extending to ankles, and stopping short at this point on both feet. Vesicles in process of formation are also observable between the clefts of the toes and around the toe-nails. Temperature 99.5° F.

The same evening the patient was seen by Sir Charles Cameron, C.B., M.D., in consultation with me. Vesicles were present on the throat, the side of the tongue, the fauces, and inside of the lips. The contents of vesicles which in the early stage were clear had now become somewhat turbid. In some instances the vesicles on mucous membranes had coalesced and ruptured, leaving small shallow ulcers with dark red base. Sir Charles Cameron, after a careful examination of the patient, said the case presented symptoms precisely similar to a previous case of foot-and-mouth disease in man which he met with in the epidemic of 1883. Saliva continued to trickle from the patient, and the painful swallowing permitted now of liquid nourishment only. The progress of the case continued without alteration—the temperature remaining between 99° and 100° F.

On August 15 the rash on the hands began to fade, the vesicles ruptured, and further vesication ceased, but the soreness of the throat and free flow of saliva continued for some days. On August 17 Sir Thomas Myles, F.R.C.S., saw the patient in consultation with Sir Charles Cameron and myself. This was the seventh day of the illness. Fresh vesicles had by this time ceased to appear, and only the remains of previous ones were in evidence on the throat, lips, and both feet. These, with the copious saliva and difficult deglutition, were the only data to guide us now. Sir Thomas Myles examined the patient's feet, throat, and hands very minutely. He also examined the wounded finger. He said that as a result of his examination, from all he had seen, and from the history given by the patient, he believed the case to be one of foot-and-mouth disease, but seeing it on the seventh day after the acute attack, it was impossible for him at that stage of the illness positively to confirm the diagnosis.

It is agreed that neither sex nor age, race nor class, affords exemption from foot-and-mouth disease. It is also agreed,

thanks to the research and logical deductions of Loeffler, that the bacillus, virus, or whatever it may be termed, which causes foot-and-mouth disease, is sufficiently small to allow of its passage through the finest pored porcelain filter, and to elude the most powerful microscope. Like the biblical grain of mustard-seed, this virus or bacillus gives rise to results in man which have taught me the lesson derived from personal observation and experience, that apparently slight cases, if neglected, may lead to grave results. Whether these results depend on tissue changes effected by the direct action of the bacillus or its toxins, are questions still in the womb of time.

In conclusion I take this opportunity of expressing my indebtedness to Sir Charles Cameron. From all the literature within my reach (both local and foreign) bearing on this subject I think I am correct in saying that Sir Charles has the unique distinction of being, not only the only medical man in the United Kingdom, but the only medical man alive to-day who can speak from practical personal experience of two separate cases of foot-and-mouth disease in man due to direct inoculation from the lower animal, one so far back as thirty years ago, during the epidemic of 1883, the other which is the subject of the present paper. I am also indebted to Sir Thomas Myles, M.D., F.R.C.S., whose examination of the patient excludes any ambiguity in diagnosis which might arise from a surgical standpoint. I also thank Mr. T. T. O'Farrell, F.R.C.S., Bacteriologist to the City Skin Hospital and to St. Vincent's Hospital, for his examination of the epithelial *débris* and contents of vesicles, with negative results. My thanks are in an especial manner due to my former patient, Mr. George J. Bell, M.R.C.V.S., who in the cause of veterinary and medical science permits me to bring before the Royal Academy of Medicine in Ireland, this case, which is, as far as I know, the first published case of its kind in Great Britain.

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"DOPING" AND THE RESEARCHES OF BRU AND ROBERTS.

By I. S. C.

It is strange that the practice of administering stimulants to racehorses has not received more consideration in England, the home of the "Sport of Kings," and where also the love of fair play is such a pardonable boast.

At last however certain recent legal proceedings have brought home to us the fact that doping is in common use as a means of unnaturally forcing to the uttermost a racer's powers, in a ruthless determination to win the coveted stakes and the collateral wagers, no matter at what expense to the "noble animal" himself.

The harmful effects of such over-stimulation of individual racehorses must have far-reaching consequences on the physique of the whole breed, the services of winners, as stallions, being so highly prized. If performances should be merely the results of doping, expectations would obviously be all too frequently falsified. Moreover, this fraudulent practice would eventually lower our high standard of performances. Degeneracy would inevitably set in, for illegitimate methods of securing priority at the winning-post would have to be universally adopted if they were openly allowed to succeed in a single instance.

However, doping has been declared illegal and disqualifying—happily for the future of racehorses, as well as for the pockets of their uninitiated backers, whose confident calculations can so easily be stultified through the introduction of the uncertainties of doping.

The elimination of this avoidable element of insecurity, where the inevitable uncertainties are already so many, must be a matter of satisfaction alike to the rich heavy plunger and to the humble labourer-sportsman who is ready to risk his last hard-earned shilling in backing the favourite.

It remains for our veterinarians to familiarize themselves with all the symptoms of doping in order that they may be equipped with the requisite facilities for detecting the effects of the various drugs which can be used in the fraud of doping.

A lead in the way of this necessary investigation has been

given to us by our highly scientific and logical Continental colleagues.

With a view to studying and determining methods of discovering the fraud, two French veterinary practitioners, Messrs. Bru and Roberts, recently subjected several horses to experiments in doping with heroin, morphia and cocaine, the drugs most usually employed.

They then contributed to the *Révue Vétérinaire* a long account of their researches. This article is re-echoed by the Italian doctor Luigi Orlando in *La Clinica Veterinaria*.

A salient fact that has been established through the French scientific researches is the great difference in effect that the same drug has over horses and dogs; the latter particularly exhibit the secondary—the narcotic property—of morphia, while horses exclusively demonstrate the primary—the stimulative property—of this drug.

Everyone knows that man, when under the influence of morphia, exemplifies its dual action, which is first stimulative and secondly sedative; but the dog exhibits the secondary effect almost from the first, and the horse never gets farther than the primary stage. He is exclusively stimulated for as long as the action of the alkaloid may last.

It is this fact which makes morphia and its derivative heroin such powerful allies of the unscrupulous horse-trainer. Through repeated experiments he can ascertain the exact dose which his equine victim can profitably carry. This varies greatly with individual animals. The administration can be timed to a nicety for the duration of the race and to last out the public appearance of the horse; but afterwards, when the reaction sets in, the privacy of the stable sees the poor beast's collapse.

"He refuses all food, accepting only water; his heart beats feebly, irregularly; his pulse is imperceptible." In a particular case: "Four days afterwards the symptoms had abated, the normal state of health was being gradually re-established, but the appetite remained capricious."

This description is quoted from the account by Messrs. Bru and Roberts of an experiment of theirs with heroin, a new and very active derivative of morphia, which is greatly used in doping.

They had hypodermically injected a seven-year-old horse (500 kilos in weight) with 35 cg. of the drug. This was mani-

festly an overdose, 5 cg. having previously been tried on a mare of the same size with quite sufficient effect, judging from the following passage:—

"An hour after the injection the first signs of excitement were apparent." They are thus enumerated:—

"The action is automatic. The gaze is fixed. The tail is raised. The muscles are contracted. The animal is very impressionable, hyperæsthesia being very evident. The ordinary sounds of the stable are sufficient to awaken uncontrollable reflex manifestations. The subject, who is by nature docile and quiet, has temporarily taken on the appearance of a highly strung thoroughbred. The salivary secretion is diminished, the mouth is dry, although drink is refused. At the point of injection local sweating persisted. This was caused by the direct action of the injected alkaloid over a superficies a little larger than a five-shilling piece. This phenomenon is important because it betrays the fact of an injection having been practised. This method of administering drugs is usually favoured because, though oral or rectal dosing is possible, the absorption is slower and more variable, being dependent on the emptiness of the intestines. In the experiment with the greatly increased dose the symptoms began much sooner, and they were so much exaggerated as to become 'alarming.' The horse's automatic, violent, blind gallop had to be forcibly stopped, and antidotes, purgatives, and sedatives had to be administered, a hypodermic injection of pilocarpine serving to hasten the elimination of the alkaloids and to curtail the period of excessive intoxication.

"Twelve hours after the heroin had been administered the violent symptoms ceased."

This animal apparently recovered, but some weeks later he died of acute podophyllitis (foot disease). The interesting autopsy amply demonstrated the evil effects of doping: "The heart was enormous—double its proper size—and the myocardium was twice as thick as it should have been." This condition shows that in doping the heart is greatly overworked, its beats being violent and hurried. The muscles are tense, the cerebral excitement constrains the horse to go automatically, indiscriminately, for vision seems to be abolished. The respiration being fuller, a sustained and unmeasured effort is rendered possible, so that he will race more rapidly than when in the normal state; in fact, "he will give out more vital force than his

physiological resources properly allow, hence he will be quite exhausted after a race, and the heart rapidly becoming worn out, a repetition of former exploits will soon be rendered impossible."

"The drugs that affect the nervous system all work much in the same way. They begin by increasing, and end by paralyzing the activity of particular nerve centres. Each of these phases is long or short, according to the dose, and according to the kind of animal under treatment."

"Injections of chlorate of morphia especially affect the encephalon, the bulb and the medulla being only affected secondarily."

This fundamental action on the brain perhaps explains the relative susceptibility to morphia of man, dog and horse. In the former "small doses (0.1 to 5 cg.) produce a certain excitement which is often sought after by neuropathics, who find in slight morphic intoxication pleasurable sensations, gaiety, hallucinations, increase of memory and imagination, a feeling of enhanced muscular power; but this phase is followed by depression with hypnotic phenomena."

Dogs can take far more morphia than man, to whom 6 cg. may prove fatal, while a dog weighing 10 kilos was proved able to survive 50 cg., though the consequent narcosis was very profound.

This secondary phase being absent in horses, their brains are presumably less impressionable than those of men, or even of dogs, in the particular parts especially affected by the secondary action of morphia and similar drugs. An explanation is thus afforded of the horse's idiosyncratic way of responding to injections of nerve stimulants, which makes him such an excellent subject for "doping."

For the same reason "it is illogical to treat colic in horses with morphia or to associate morphia with chloral in order to produce anæsthesia, for the morphia greatly agitates the horse during an operation, and the chloral renders him unable to get up after it. This happens too often through the thoughtless use for horses of prescriptions only suitable for men." Thus comment Messrs. Bru and Roberts.

Cocaine is also much used for doping, but though it is a powerful dynamic agent, augmenting for a time the muscular force, its effect is more transient, and its administration therefore

demands even more exactitude than that of heroin and morphia. Injections can only be depended on to work for a specified time.

"If the dose is too strong depression and adynamia sooner or later ensue. . . . Sometimes under the influence of cocaine a horse will stamp so violently as to fracture the phalanges where there is osteitis."

The following symptoms characterize the action of cocaine:—

"A great flow of saliva; sweating, first localized at the point of injection; dilatation of the pupils. The simultaneous presence of such conditions should arouse the suspicion of doping," a practice which cannot fail to be severely censured by the veterinary profession.

But even if, as sometimes happens, doping can be diagnosed at a distance by the characteristic hyperexcitability alone, it is necessary to make absolutely sure before any accusation can be made, "as it is possible for very nervous horses to behave in a suspicious manner when in the company of others and when naturally excited at the moment of a race."

Only quite recently has it become possible to ascertain actually whether a horse has been doped or not.

The fraud can now with certainty be revealed through the method which M. Kaufman imported from Austria, and which has been adopted in France and Italy. It consists in a test of the saliva, which always very quickly eliminates alkaloids, and which is more easily collected than the even more eliminatory urine. By means of a pad of cotton-wool a specimen of the winner's saliva can be obtained immediately after a race, and subsequently this can be examined at leisure.

Fröde's testing preparation will reveal the presence of morphia and heroin; that of cocaine can be detected through Ferreira da Silva's reagent.

The tests employed by Kaufman are kept secret lest they should by any means be counteracted, so there is no longer much chance for doping to escape exposure if veterinarians are all on the watch for it, and, as Dr. Luigi Orlando says, "Racing Associations can never be too vigilant in the suppression of the fraud of doping."

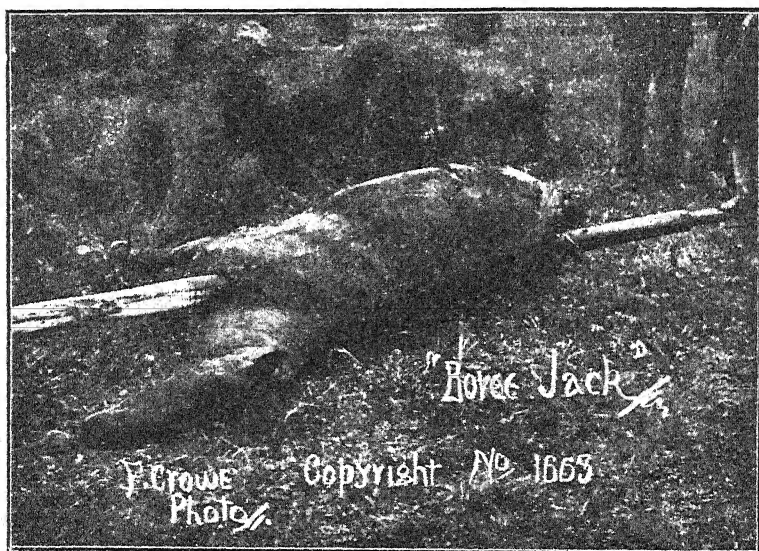
A TERRIBLE ACCIDENT TO A RACEHORSE.

By F. B. EVE, M.R.C.V.S.

Folkestone.

THE enclosed photograph was sent to me by a friend in Australia, and is, I imagine, unique.

A racehorse, whilst finishing the course on the West Wyalong (New South Wales) race-course on October 2 last year, ran into the end post of the fence on the inner rail (a sapling 14 ft. in



length and 3 in. in diameter), and this entered inside and under the shoulder-blade, the impetus carrying it right through the body and causing the pole to protrude for fully 3 ft. beyond the hip. The horse swayed for a few moments and then fell dead in full sight of numerous horrified spectators, the body afterwards being photographed where it lay.

CAPONING.

By HAROLD LEENEY, M.R.C.V.S.

Shepton Mallet.

THIS operation is said to have been performed in China from time immemorial. The manner of it is characteristically cruel. Castration of cocks was for a long time practised in Surrey, in the original home of the five-toed Dorking, but fell into desuetude owing to the great number of fatalities, and the general neglect of poultry in the middle Victorian period, and before the agricultural slump came which led to investigation of what the shopkeeper calls "side lines," which can be turned to profit. In the latter part of the last century, when the ripping open of the abdomen and tearing out of the testes with the fingers had been left to three old women near Dorking who were the sole repositories of the art, a new star arose in the middle-west of the U.S.A., and caponing, together with rig castration and other new methods of emasculation were introduced. It is to our credit as a profession that we welcomed instruction from an amateur or unqualified man, who did not pretend to be a veterinary surgeon, but could show us much that was valuable, and has been incorporated into our system since. *Inter alia*, one may be permitted to remark that "good *can* come out of Galilee," and that the attitude too often assumed by the high priests of science is as unworthy as that of the Sanhedrin.

Some notes in this Journal in regard to ostriches provoked a smile when the information was given, as a new discovery, that the feathering of birds is altered by removal of the essential organs of reproduction. That great naturalist, the late Mr. Tegetmeier, called attention at least fifty years ago to the male plumage of hen pheasants resulting from gunshot wounds affecting the ovarium or egg clutch. The common result of emasculation of male birds is to arrest the development of the typical cock feathers. The hackles do not develop to the same extent, and the comb and lobes are smaller, as a result of early operation. They do not change if done late, or drop off in ten days, like the antlers of buck when emasculated. The effects of unsexing in the case of horses, cattle and swine are, of course, familiar to us all, but it may not be so generally known that depriving the cat of the ovaria causes her to grow a "tommy"

head, and that, whichever sex is made neuter, influences conformation and features in the direction of the opposite sex. The effeminate head of the gelded cat is familiar, but the "tommy" head of the "fourth" sex is not perhaps. But to return to our muttons. The practice of caponing has for its object the enhanced value of the bird submitted to operation. The objectors have said that cockerels segregated from feminine influence agree perfectly well, and that there is no need for operation. With the first part of the statement practical poultrymen will agree. That capons attain to much larger proportions is only known to those who deal in them. Caponing is best performed during the months of August, September and November, when cockerels are cheap and unruly and will fight among themselves and worry the pullets—"will not rest themselves or let anyone else," as it has been said. When castrated they can be allowed in any company. They are no longer combative, but usually found together, and as much despised by the females of the flock as eunuchs are by the ladies of the harem. They are disposed to sit about when not seeking food, and this, of course, favours growth and development of certain parts. The muscles used in combat are not among them, for the head and neck takes on an effeminate appearance, but the rump expands, and the poulterer knows in a moment whether a fine grown cockerel or a capon is offered him. At the time of writing, Leadenhall prices for the former are 3s. 6d. to 4s. 6d. each, and for the latter 7s. 6d. to 8s. 6d. These figures are sufficiently eloquent, and we need not labour the question as to the value of the operation.

The Method of Operation.—Any description is unsatisfactory. A demonstration is most desirable. True, one can teach oneself. The present writer did so, but finds much satisfaction in showing pupils how to avoid his errors. It is essential that the birds should be well fasted. A period of thirty hours is desirable, as by that time the intestine is more or less collapsed as well as empty, and a view of the testicle can be obtained when it is desired to remove it. The subject is stretched upon a table after the manner one extends a sow pig for spaying. In the absence of help, one may suspend a bottle of water from the butts of the wings and the legs, in order to secure the subject. Then the few small feathers between the last two ribs and the point of

the hip may be plucked, and the operating site exposed. This is between the last two ribs. With a clean incision the skin and intercostal muscles are divided. As with castrating animals, a bold sweep of the knife causes less hæmorrhage than a feeble funky pricking at the tissues, and there is no risk of puncturing the bowel if the fasting period has been observed. If the incision is made high enough up there will be found a V-shaped opening in the peritoneum, and under this the surgeon introduces his scalpel, with cutting edge upwards, and divides the membrane for the full length of the wound. This gives a view of the testicle when the spreader or gridiron instrument has kept the ribs apart. Then one has only to introduce the spoon-shaped forceps and seize the organ in order to bring it out. It is well for beginners to squeeze the testicle out of its investments, rather than to break the vessels by throwing the hand aside, as one does when confident and with a large number to get through in a given time. Hæmorrhage is thus avoided. The bird is then turned over and the same process gone through in order to reach the other gland. It is much less trouble and more safe to operate on both sides than to seek both organs from one side. The bird is then liberated, and will generally try to recoup himself by swallowing the missing testes if some soft food has not been provided in anticipation. The appetite is not in abeyance, and the subject takes no notice of such a trifling incident in his career.

Sequelæ.—If a bird is going wrong it will be immediately. The rupture of a great vessel is followed by tumbling head over heels like one whose neck has been broken. He may be washed out with vinegar and hung up in the larder to be eaten like any other fowl.

During the summer now past I had but one bird tumble over, and while seeking some water altered my mind and roused him with ammonia. In a few minutes he fed with the rest and throve as well as any subsequently. Nothing should be done to the wound. It quickly seals with a clot. The only trouble experienced is a blowing up of the flank in a few cases. The remedy is to prick the skin and let the air out. The bird is not inconvenienced in any way if this is not done.

Country practitioners desirous of adding a few pounds to their income should do a few birds and place them out to board,

or show specimens, as a district soon learns the value of capons, and salesmen are glad to buy at greatly enhanced prices. The caponer will not, of course, choose the Mediterranean types for making big capon, but go for Plymouth Rocks and first crosses of Indian game and Dorking, or the now popular Sussex fowls. It may be mentioned that "fine Surrey fowls," which are always quoted at the top of the market, come from Sussex, and chiefly from the district known as "The Dicker," where caponing has been carried on by two or three famous families of veterinary surgeons for generations.

WHITE DIARRHŒA IN CHICKS.

By B. F. KAUPP, M.S., D.V.S.

*Spartanburg, South Carolina, Commissioner of Public Health, Bacteriologist
and Pathologist, Board of Health.*

THE loss to American poultry raisers from white diarrhœa is greater than from anything else, perhaps greater than from all other infectious diseases combined. It strikes at the root of the poultry industry; no one can successfully conduct the business if he is unable to rear a reasonable number of chicks annually.

Without treatment the resulting mortality, when white diarrhœa has secured a foothold in a poultry plant, is extremely high, often reaching 90 per cent. of the season's hatch. The loss from white diarrhœa in dollars and cents is enormous, almost beyond calculation. It is widespread throughout the United States, and causes the loss of perhaps 10 per cent. of all the chicks hatched in this country. By proper measures the disease is fairly easily preventible, and my experiments indicate that a large number of the chicks afflicted with this disease will recover under proper treatment.

CAUSES.

There are two forms of white diarrhœa, due to two distinct causes: a bacillary form due to the *Bacterium pullorum*, a rather short, plump, rod-shaped germ with rounded ends; and a protozoal form due to the *Coccidium tenellum*. I have isolated the germ causing the disease from the liver, spleen, kidneys, and other organs of chicks dead of the bacillary form of the disease,

and in the coccidian form from the ulcers of the cæcum and the intestines.

SYMPTOMS.

Bacillary Form in Young Chicks.—Drooping wings, ruffled feathers, sleepy appearance, huddled together, little or no appetite, abdominal yolk not properly absorbing; whitish or whitish-brown frothy discharge from bowel which adheres more or less to the vent fluff; eyes closed part of the time, and apparently no interest in life. “Peeping” much of the time, the appearance in many is stilty, abdomen prominent behind. In these cases after death one finds the yolk unabsorbed or only partially so. The intestines are more or less full. Late fall, winter, or early spring hatched chicks are freer from the disease than summer hatched. This may be explained by the fact that hens with diseased ovaries gradually become poorer layers as the disease processes advance, and hence only lay in late spring or early summer when Nature intends reproduction of birds. Finally the hen may cease laying.

Coccidian Form.—The symptoms, as I have seen them, are similar to those of the bacillary form, excepting, as a rule, the heavy death-rate takes place later.

MODE OF SPREAD.

Bacillary Form.—Ovaries of laying hens, diseased, but still functionating, may be infected by the germ. The germ can be isolated, particularly from the yolk of at least some of the eggs formed in such an ovary. The chicks from infected eggs, as a result, have the disease more or less developed when they are hatched, as conditions which favour hatching also favour the multiplication of the germs to an extent that toxins (poisons) have already been produced in the young in sufficient quantity for the disease to at least manifest itself in a few hours after hatching. The whitish, frothy, pasty bowel discharge, more or less sticky, and having a tendency to “paste up the vent,” from these chicks is laden with the germ, and others of the flock soon become infected from contaminated food picked up from the ground. In the former case chicks may begin to die soon after hatching, in the latter in from three to four days, a few dying each day. The death-rate is high, reaching in many cases as

much as 75 per cent. or more. Those that recover are stunted, and do not make satisfactory growth. The greatest loss is from the first few days to, in some cases, two or three weeks. It is probable that the carriers are chicks that have recovered, but which have established immunity, and still carry the organism (especially in the ovary) as the human typhoid carriers carry the germs of typhoid fever, in the infected kidneys and in bowel ulcers. These "carriers," having established an immunity, do not themselves succumb to the disease, and they rarely show any outward symptoms of it.

Coccidian Form.—The mode of spread of this form is at present problematical. It is possible that a chronic type of coccidiosis occurs in some birds and thus perpetuates and scatters the protozoa.

POST-MORTEM FINDINGS.

Bacillary Form.—The liver in general is usually pale, showing areas of congestion (active and passive congestion and cloudy swelling). The yolk only partially absorbed, congestion of the intestines may or may not be present. Kidneys normal in size, but show congestion and cloudy swelling. Carcase more or less pale, and emaciated and anæmic.

Coccidian Form.—Upon *post-mortem* examination the conditions are found to be similar to those in the bacillary form, except there will be noted more or less congestion of the intestinal mucosa (lining), and ulcers in the intestines, principally the cæca. The cæca appear to contain considerable ingesta, and to be interfered with functionally. All stages of the *Coccidium tenellum* are observed in a mass of dying and disintegrating cells—the remains of the diseased mucous lining of the bowel. Repeated examinations have been made of healthy chicks killed for the purpose, and chicks dying from other causes, and thus far no case has shown these conditions.

TREATMENT.

Unsanitary conditions, spoiled feed, dirty stagnant water, improperly ventilated incubators, brooders, and building, or badly regulated heat, are factors in weakening the physical condition of chicks and favour ravages of diseases.

The most of our experimental work with various remedies

have been with the coccidian form. In one outbreak referred to above 80 per cent. of the first hatch of 2,000 chicks had died. We began trying to improve sanitary conditions, and administered various dilutions of permanganate of potash, copperas, and carbolic acid. The loss was unaffected. By this time the writer had examined many dozen birds in his laboratory, and in about 50 per cent. of the cases the *Bacterium pullorum* was isolated from the heart-blood, liver, spleen, and kidneys, and in every case the coccidian ulcers described above were observed.

These chicks began dying in numbers at about ten days of age, very few had died before that time, and from this period to the end of the third week the great loss occurred. After this time but few died, but those having the disease in light form were stunted and did not make satisfactory growth. With this data now before me I now began on another line of treatment.

During the past ten years I have used, to greater or less extent, dilutions of mercuric chloride (corrosive sublimate) as an intestinal antiseptic in chickens. This was used, in this outbreak, in a solution of 1:10,000, with sulphocarbolates of zinc, sodium, and calcium. The latter had not given the satisfactory results when used alone that it had in treatment of diarrhœa in colts and calves.

Jones (Cornell) has shown that a solution of 1:1,000 (one-tenth of 1 per cent.) bichloride of mercury will kill the *B. pullorum* in thirty seconds; a 1 per cent. carbolic acid solution requires five minutes in which to kill this germ; 1 per cent. creolin requires five minutes; 3½ per cent. lactic acid kills it in five minutes, and 5 per cent. carbolic acid kills it in thirty seconds. Mercuric chloride is therefore fifty times as effective against this germ as is carbolic acid.

Instructions were given for the incubators (containing also the nursery trays) to be tightly closed and fumigated with formaldehyde gas as recommended under chicken cholera, before filling with eggs.

After the chicks were hatched they were not to receive any feed for forty-eight to seventy-two hours, as the yolk contained in their abdominal cavity will furnish food for that length of time, and an engorgement of the intestines might impinge on this part and interfere with its absorption by pressing on the absorbing vessels. The following dilution was to be kept before

them from the time of hatching to four weeks of age, and then given twice a week for the next few weeks: Zinc sulphocarbolate. 15 gr., sodium and calcium sulphocarbolate, of each $7\frac{1}{2}$ gr., bichloride of mercury 6 gr., and citric acid 3 gr. This quantity was dissolved in a gallon of water. The result was that 80 per cent. of the next hatch was saved by this treatment.—*American Journal of Veterinary Medicine.*

BLOOD DISEASES OF BIRDS.

By B. F. KAUPP, M.S., D.V.S.

Spartansburg, South Carolina.

UNDER blood diseases come the septicæmias as apoplectiform septicæmia, septicæmia of geese, typhoid of fowls, and spirochætosis, all caused by germs which live and multiply in the blood-stream.

APOPLECTIFORM SEPTICÆMIA IN CHICKENS AND PIGEONS.

This disease is due to the *Streptococcus gallinarum*, which grows in long or short chains. It can be readily grown upon artificial media, and does not liquefy gelatine. Experimental inoculations with this organism killed the following animals: chickens, mice, rabbits, and swine. It does not kill guinea-pigs or dogs. The germ multiplies in the blood.

Symptoms.—Apoplectiform septicæmia is rapid in its progress. Often birds die in from twelve to twenty-four hours after the first symptoms appear. Birds in which no symptoms of the disease had been noticed may be found dead under the roosts. The bird shows great prostration, feathers ruffled, loss of appetite, and the condition rapidly terminates in death. This disease often causes great loss to pigeon fanciers.

Post-mortem Findings.—The spleen is enlarged, dark and soft. Local necrosis is noted in the kidneys, spleen, and liver. Cloudy swelling is also noted preceding this state. Pneumonia may be present. The germs can be isolated in pure culture from any of the organs named.

Treatment.—Sanitation as directed for chicken cholera (May issue *Veterinary Medicine*, p. 262). If possible separate the

healthy birds from the sick. Vaccination with a vaccine made from the *Streptococcus gallinarum* has given good results. Sulphocarbolates compound may be tried as outlined in the article on chicken cholera referred to above.

SEPTICÆMIA OF GEESE.

This disease has been described as being caused by a germ which closely resembles the polar staining germ of chicken cholera. It multiplies in the blood.

Symptoms.—Geese are often found dead without having been noted to have been ill. The majority die very quickly, that is, within two or three hours after first symptoms appear. Occasionally one bird may live for several days, but finally dies.

Post-mortem Findings.—Small pin-point hæmorrhages may be noted, especially in the mucous lining of the intestines. Usually the digestive tract contains food in all stages of digestion, indicating that the disease is very rapid in its onset. Considerable mucus may be found in the mouth and throat. Inflammation may be noted in the liver, pericardium (heart sac), spleen, and kidneys.

Treatment.—Sanitary measures the same as those given for chicken cholera.

FOWL TYPHOID. INFECTIOUS LEUKÆMIA.

This is due to a short, plump germ with rounded ends. It is called the *Bacterium sanguinarium*, and is easily isolated from birds dead of the disease. It reproduces the disease in inoculated birds, multiplying in the blood.

Symptoms.—Anæmic or blanched appearance of the mucous membranes of the head with a dull appearance and great prostration, usually ending in death in about four days, is characteristic of this disease. In some cases the affected bird may live three to four weeks. Moore reports a decrease in red blood cells and an increase in white blood cells, the latter principally the polymorphs.

Post-mortem Findings.—The liver is enlarged and mottled with greyish patches due to areas of leucocytic invasion. The germ can be isolated from the internal organs. The kidneys show congestion which is recognized by the minute red lines. The intestines may be congested. The spleen usually appears

normal in size and colour. The red blood cells gradually diminish and a leucocytosis (an increase of the white blood cells) appears.

Treatment.—Prompt isolation of the healthy from the sick birds and sanitary measures as given for fowl cholera.

SPIROCHÆTOSIS.

This is a blood disease (septicæmia) due to a spiral-like microscopic germ which is supposed to be carried from bird to bird by means of the chicken tick. Fig. 1 shows a drawing of the germ. It is the *Spirochæta gallinarum*. The slide from which this drawing was made was kindly sent to the author by Dr. Balfour, of Khartoum, Sudan, Africa.

In the sick animal is noted a dulness, loss of appetite, rapid emaciation, head and tail down, and standing around, in corners

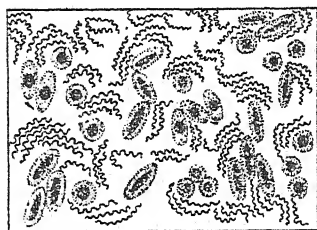


FIG. 1.—Drawing of *Spirochæta gallinarum* made from a blood smear; showing thrombocytes, leucocytes, red blood cells, and myriads of corkscrew-like spirochætes.

or on the roost, with eyes closed. Fig. 2 shows a photograph of a typical case. Note the attitude of head, tail, and body.

This disease was first recognized in Brazil; it is found in Africa and Europe; and a disease occurring in the southern part of the United States, where the chicken tick is abundant, has symptoms similar to those described above. So far as the author knows no definite work has been done to determine the true cause of this southern chicken disease.

This disease is most common among chickens, but also infects geese, ducks, pigeons, and sparrows.

Another form of septicæmia in chickens is caused by a comma-shaped germ, the *Spirillum Metchnikovi* or *Vibrio Metchnikovi*.

The symptoms are similar to those of fowl cholera, except that there is no, or at most but slight, elevation of the temperature. Diarrhœa is constantly present. Inflammation of the

bowel and enlarged liver (hepatitis) is noted. The disease has not been reported in this country.

THROMBOSIS.

A bird was sent to the laboratory with the history that it had been sick for several weeks. There was a partial loss of appetite, finally complete loss; the bird showed weakness and a gradual emaciation. The hen died in about two weeks after coming to the laboratory.

At autopsy there was noted great emaciation. All organs appeared normal except the circulatory system. There was

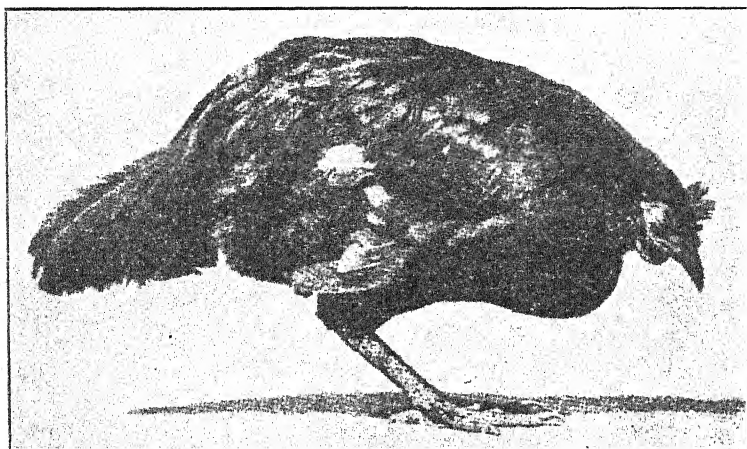


FIG. 2.—Photograph of hen suffering from acute spiröchaetosis—after Balfour.

thrombosis (complete plugging) of the right brachial artery (artery to right wing) and the same of the large vessel to the liver as well as of the iliac and femoral artery of the left side (artery to left leg). Upon microscopic examination they were found to be white *thrombi*.

BLASTOMYCOSIS OF THE PIGEON.

There is a condition in pigeons in which there is a nodular mass in the upper portion of the oesophagus, due to a kind of yeast-like germ. It is termed blastomycosis, and is well illustrated in fig. 3. The squabs become affected early, and as the diseased or tumour-like area becomes larger, the bird is unable to eat or swallow. The loss in some breeding establishments is

considerable. The disease-area manifests itself as a lump in the throat or neck, which is easily felt.

Treatment.—It will be necessary to keep the premises thoroughly clean, constantly disinfected, washed with an antiseptic. The trays after each batch of squabs need to be cleaned and disinfected, as in fact does the entire building.

Some good results have been obtained by treating these squabs early with a solution of sulphocarbolates compound. Also other antiseptics recommended for chicken cholera. In squabs it will be necessary to use a medicine dropper and inject the solution into the mouth several times a day. If the disease has progressed very far, it is best to kill the squab and cremate it.



FIG. 3.—Blastomycosis of a pigeon.

A. The necrosing mass in which may be found yeast-like bodies.

COCCIDIOSIS IN WILD DUCKS.

Two wild ducks (mallards) were sent to the laboratory by the game warden of Colorado during the fall of 1910, with the history that they had been found dead on a reservoir, and that the wild ducks were dying in large numbers. A careful autopsy was held on these. There were small pearl-like nodules throughout the lung of one of the ducks. Both showed ulcerations of the mucous membrane of the intestinal tract. These ulcerations were numerous, as many as eight or ten in each bird, and extended the entire length of the intestines. Upon microscopic examination of these lesions, as well as of the lung nodules, coccidia were noted which resembled the *Coccidium tenellum*.

Clinical Articles.

VERGOTININE IN A CASE OF BROKEN WIND.

By G. MAYALL, M.R.C.V.S.

Bolton.

A BAY van gelding, "Prince," 13 years old, was badly affected with broken wind. Expiration was performed with a pronounced effort of the abdominal muscles and there was a marked depression along the costal arch, sinking in of the intercostal spaces and the usual barrel-shaped thorax. Difficulty in breathing was quite noticeable and the nostrils were dilated at each inspiration. There was an occasional weak cough and the animal's condition was poor. Quick work kept up for half an hour caused much distress in breathing. On auscultation we could hear weak vesicular breathing and a rather weak apex-beat of the heart. Percussion sounds over the lungs resonant and loud. Respirations at ease and before exertion were 18, pulse 44, temperature 100.4° F.

Treatment with vergotinine was commenced on September 23 and continued until November 3. Two and a half bottles of vergotinine have been used. The results have been gratifying. Respirations now, after fairly severe work, are quiet and regular. The former noticeable double movement of the flank is no longer discernible, the flapping of the nostrils has disappeared. The respirations after slight exertion are sixteen per minute. Whether the present favourable state of affairs will last is difficult to determine, but a horse rapidly becoming useless has been kept at work, its state improved gradually, and restored to its former usefulness. The general condition of the animal has visibly improved, and in appearance he now does the stable no discredit.

The composition of vergotinine seems to be strychnine, veratrine and ergotin, combined with glycerine. It is doubtful whether it will restore badly degenerated pulmonary tissue and capillaries.

French reports of its efficacy in cases of broken wind are more encouraging than German ones, but there seems no reason to believe that it is not a very good therapeutic agent, and perhaps the best that has yet been brought out for the treatment

of broken wind. In cases of bronchial catarrh it appears to be especially beneficial, but it is rather dear to dispense in the form in which it is made up at present. The usual dietetic rules adopted in cases of broken wind have, of course, to be observed whilst horses are being treated with vergotinine.

PECULIAR SYMPTOMS OF ILLNESS DUE TO EATING LARGE QUANTITIES OF FERN.

BY STAFF VETERINARY SURGEON KINSKY.

THE patient after riding exercise refused all food and only took water listlessly and unwillingly. The horse, usually cheerful and lively, was dull and sleepy. It lay prone on the straw, looked round frequently at the flank and yawned markedly. Pulse, breathing and temperature normal. Mucous membrane of the eyes, mouth and gums coloured yellow; peristalsis checked; dung hard and coated with yellow slime. Urine frequently passed with groaning and switching of the tail; colour of the urine yellowish red. The whole train of symptoms reminded one of the lupinosis described by Friedberger and Frohner. It was ascertained that at riding exercise the horse often stood in a wood for hours together and here ate large quantities of ferns with evident relish. Believing that no injurious effect would arise the horse was not hindered in the act.

Treatment.—The horse received a dose of physic, Priesnitz compress was put round his abdomen, clysters of soap and water and an arecolin injection were given. Copious, pulpy, bad-smelling dung was soon passed. The horse became livelier, appetite better, and icteric symptoms disappeared. After three days, however, the skin was covered with eruptions from the size of a 10-pfennig piece to that of a hand-plate. These elevations affected both sides of the neck, both shoulders and the front surfaces of both hocks. Stroking them with the hand caused the horse considerable pain. Skin increased in warmth, body temperature rose to 39° C. Green food and fermentation with acetate of lead and alum solution caused the lumps to partly disappear after a few days. Pustules, however, formed in the regions mentioned and were very painful in front of the hock, the joint being kept extended. Pieces of skin sloughed off, but

the places healed after being washed with antiseptic and treated with lanoline ointment mixed with powdered sugar and zinc oxide. Duration of illness about three weeks. Now, after about a year, only numerous light-coloured patches of skin remain.—*Zeitschrift für Veterinärkunde.*

RECURRENCE OF URTICARIA IN THE HORSE.

By F. MULLER, D.V.M.

Lilienthal.

At the beginning of August of this year a horse was brought in for treatment suffering from an extensive nettle rash. On the back and flanks the patient was covered with lentil to hazelnut sized elevations. On the soft parts of the skin, such as the belly, inner surface of the limbs, sheath, rectum, ears, nose, eyes and lips, there were lumps as big as a strong man's fist. The head of the animal was deformed and resembled that of a hippopotamus. At the place where the halter passes over the bridge of the nose there was a deep indentation. I gave the patient a dose of physic, and ordered washings with Burow's solution. On the third day the skin elevations had disappeared and the head assumed its normal proportions. Soon, however, the rash reappeared, but only hazelnut sized swellings occurred. The condition came and went. It varied to better and worse. This continued for five weeks, so that the animal could only be used very little for work. By the use of fresh oats and the use of calomel in full doses healing was accomplished and the horse has kept well since. The cause of the complaint and its recurrence was due to feeding on so-called Russian oats which the animal received previous to and during the illness.—*Berliner tierärzt. Woch.*

HYDROGEN PEROXIDE IN FISTULOUS WITHERS.

By J. FRUCHT.

Veterinary Surgeon of Nadworna (Galicia).

On July 16, 1913, a twenty-year-old bay gelding was brought to me with a discharging wound on the right side of the withers. The owner had bought it for 10 kronen on account of its skin, and asked me whether eventual healing of the wound was possible.

I examined the wound and found a two-crown piece loss of substance with inverted edges, the neighbouring skin for a hand-breadth being hairless and inflamed, and yellowish creamy pus flowed copiously from the wound.

I could push a probe in for 15 cm. on to rough bone. Treatment consisted in daily injections of a 1 per cent. solution of Merck's hydrogen perox. pur. With this treatment the quantity of pus declined daily, granulation proceeded rapidly, and on the thirteenth day the wound had closed. It was dusted with tanniform, and the horse discharged cured and fit to work on the fifteenth day.—*Oesterreichische Woch. für Tierheilkunde.*

STRYCHOTIN (LIQUOR STRYCHNINI-VERATRINI CUM ERGOTINO).

By DR. SUSTMANN.

Dresden.

DR. SUSTMANN has tried strychnotin on seventeen subjects, of which two were broken-winded, eight had acute and chronic bronchial catarrh, four had rheumatism in the region of the shoulder and neck muscles, and one each with chronic laryngitis, with acute shoulder lameness, and with chronic pneumonia and pleurisy. The principal effect of the medicine, in Dr. Sustmann's opinion, is due to the veratrin, for this drug is not only an excitant for the cross-striped muscle and for the breathing centre, but also acts as an anti-paralytic and anti-rheumatic. The second effect is due to the strychnine acting as a nerve stimulant on the whole nervous system, and at the same time influencing the contractile elements of the lung parenchyma. The ergotin supports the treatment by first narrowing the bronchial vessels and then by increasing the contractility of the bronchial muscular fibres hindering the collection of mucus in the air canals.

The fourth component, glycerine, acts as a vehicle, and although not perhaps producing much effect, yet in human medicine various experimenters have found that teaspoonful doses of glycerine continued for some time have increased strength and body weight in weakly patients. The avoidance of large quantities of hay and of severe exertion are indicated whilst animals are under treatment.

Dr. Sustmann comes to the following conclusions as a result of his experiments:—

(1) Strychotin is a combination of drugs, whose value on the one hand depends on the effect of its single components, and on the other hand on its peculiar composition and dispensing. It is identical in its composition and effect with the French vergotinine.

(2) The effect of single drugs (ergotin, glycerine, strychnine and veratrin) contained in strychotin is enhanced by the combination, and a favourable collective effect is produced.

(3) The use of strychotin is therefore indicated where the possibility of recovery of the tissues is present. Advanced broken wind is therefore hardly to be expected to be cured.

(4) The best results obtained are in acute and chronic bronchial catarrh, in acute shoulder lameness and in rheumatic conditions of horses.

(5) The use of strychotin visibly improves the condition of animals and has no injurious by-effects.—*Deutsche tierärzt. Woch.*

OBSERVATIONS ON THE EFFECT OF SUNLIGHT ON THE HORSE AND COW.

By DR. A. SALVISBERG.

Tavannes.

IN human medicine the effects of the sun's rays as a healing factor is made use of considerably. Not only is the whole body submitted to sun baths but locally different diseases, such as lupus, ulcus cruris, carcinoma, &c., are illuminated by the sun. That a sunny neighbourhood is desirable as a sunny dwelling place for man has been known for a long time. Senderreger, in his "Advance Posts in the Care of Health," says that "Where the sun does not penetrate the doctor does." If sunshine has an influence on man it must also have an effect on animals.

The components of sunlight, such as radium, polonium, actinium, are very much used in France in veterinary medicine. They are present in Bones's radio-actives. As plaster, baths, and damp bandages this radio-active clay is used in generalized

eczema, in sprains, lymphangitis, tendonitis, and many other inflammatory symptoms.

Case 1.—In February, 1904, I treated a six-year-old bay mare for petechial fever. The therapy used was intravenous injections of argentum colloidal. In summer of the same year the long-recovered mare showed a number of swellings all over the body. The very anxious owner thought that purpura had occurred a second time, and urged me by telephone to come immediately. I recognized at once that I only had urticaria to deal with. It was a very hot summer day with a clear blue sky. The horse stood against a wall, turned with all his broad side to the sun. Whilst I was telling the anxious owner that the nettle rash had no connection with the previous illness all the skin elevations disappeared entirely. We were both greatly astonished at this phenomenon, and all the more so as we found that the side on which the sun did not shine direct was in no way altered. All these swellings were still present just as the others had been a few minutes before. With watch in hand I now measured that it just took five minutes for the previously shaded side of the horse to be completely rid of the elevations. The complaint did not recur.

Case 2.—In the summer of 1911 I was called to the village of S. by Herr K., saying that he had a cow affected with foot-and-mouth disease. I believed that the case would turn out to be actinomycosis, as it was in a neighbourhood where such cases are frequent. Examination revealed a solar dermatitis of the muzzle, the base of the teats, and the portion of the vulva not covered by the tail being also affected. The dermatitis had already advanced to necrosis, the skin was leathery, black, and was beginning to slough through its whole thickness at the edge of the subcutis.

It was noteworthy that this six-year-old cow had been driven on to the meadow since its youth, and had never previously been attacked by this disease.

This effect, according to present-day literature, is not a thermic one, but due to ultra-violet rays.

Case 3.—A thirteen-year-old draught stallion was driven about fifty-five miles on the hot summer day of June 23, 1912, and on arrival at the destination he refused food, took up a dog-sitting posture, commenced to stagger, rolled over, and died.

Autopsy made the next day gave the following result:—

Good *rigor mortis*, natural openings of the body closed. After removal of the skin the hindquarters showed anæmia as in slaughtered animals. The visible blood-vessels of the fore-quarters, but especially those of the neck and head, were chock-full of black, unclotted blood. Lungs enlarged, not collapsed, and œdematous. Tracheal mucosa cyanotic, with many ecchymoses. Trachea and bronchi filled with slightly bloody foam. The swelling of the larynx was so great that there was scarcely room to admit the little finger into the lumen (glottis œdema). In the cavities of the brain there was a small quantity of slightly blood-tinged fluid. The meninges were greatly injected; the brain substance showed no changes, no visible macroscopic hæmorrhages, but very damp. Concha cyanotic; region of the ethmoid bone very hyperæmic. *Diagnosis*: Heat-stroke.

Case 4.—On July 17, 1912, the seven-year-old horse of an undertaker yoked to a vehicle suddenly fell and died. *Post-mortem* showed a like result to the previous case, viz., heat-stroke.

Case 5.—A foal a year and a half old was found dead in a stable with a cement roof which had become very hot. *Post-mortem* showed a like result as in the two preceding cases.

The French distinguish a *sunstroke* that may arise through the direct influence of the sun's rays on the cranium. Further, a *heat-stroke* due to great heat and increase of body warmth. Hutyra and Marek oppose this view. But Marinesco has experimentally proved that the bad effects occur equally prominently if the animals are subjected to oppressive heat in quite dark abodes. According to my observations I must also agree with this view, since the foal under the cement roof was certainly not directly exposed to the sun's rays. *Post-mortem* showed just the same phenomena as in the two other cases due to direct sunlight.

P. C. Freer, in his treatise on "The Effect of the Sun's Rays on Man and Animal in Different Latitudes," says: "The colour of the animal plays an important rôle. The darker the colour, the earlier the heat-stroke temperature was reached."—*Schweizer Archiv. für Tierheilkunde*.

ALBUMINURIA IN THE HORSE, COW, AND DOG.

BY VETERINARY SURGEON KARL NAGEL.

THE disintegration products of albumen, the albumoses, are not met with in physiological urine, in pathological urine their occurrence is a very frequently noticed symptom.

According to Finigan the following groups may be discerned:

(1) Alimentary albumosuria. This is caused by an abnormal direct transition of the albumoses of the gastro-intestinal canal into the blood; thus it occurs from partaking of great quantities of artificial nourishment which is rich in albumoses, in ulceration and diseases of the intestinal mucosa (ulcus ventriculi, carcinoma).

(2) Hæmatogenous albumosuria. It consists in decay of cells, namely, the leucocytes, in the blood itself, or in effusions of blood and pus from which the albumoses pass into the blood.

(3) Nephrogenous albumosuria. This may be met with especially in acute and chronic nephritis as a contemporary symptom of albuminuria. The transition of the albumose from the blood occurs as a result of better capability of dialyzation or it occurs in the urine from tissue decay or the transformation of albumens into albumose.

At the conclusion of his dissertation the author makes the following points:—

(1) In the urine of healthy domesticated animals (horse, cattle, and dog) one finds no albumoses.

(2) In sick animals one encounters albumosuria in purulent processes accompanied by destruction and decline of tissue.

(3) Albumosuria and fever are very frequently but not invariably associated.

(4) In locally limited and extensive tuberculosis of cattle albumosuria is wanting or is only slight. Albumosuria is therefore not valuable prognostically for this complaint, but is, perhaps, of slight value diagnostically.

(5) For the diagnosis of traumatic indigestion in cattle the high albumose contents of the urine is probably of value.—*Deutsche tierärztl. Woch.*

ON THE TREATMENT OF CANKER.

BY DR. OYEN.

Kostenblut.

SOME unexpected cures in cases of canker have happened with me where other collegians have been treating cases. The following is my method:—

Careful removal of underrun horn, painting every day or other day once with pyroligneous acid, 2 parts, and formalin, 1 part. In obstinate cases powdering also with aerol. Pressure dressing also advisable.

In all cases treated sound horn has appeared in a short time. There has been no recurrence of the complaint. I shall be obliged if gentlemen having success with this treatment will communicate with me.—*Berliner tierärztl. Woch.*

CONTUSION OF THE BRAIN WITH SECONDARY AMENTIA AND RECOVERY.

BY DISTRICT VETERINARY SURGEON WEOLF.

Ulefos.

A FIVE-YEAR-OLD cow which was in the fifth month of pregnancy stood with fore-limbs propped out, quite listless, and with her head sunk to the ground. Temperature was 39.2° C., pulse 32, slow but regular, respirations 12, heart-beat scarcely perceptible, corneal reflex absent, skin sensitive. The left fore-limb, which during auscultation was carried forward, remained bowed for several seconds after an assistant had let go of it. Some hay remained in the cow's mouth. It was pushed in in order to see if the cow would eat it. As soon as the head was lifted up for examination mastication began vigorously and then suddenly stopped. In chewing the jaws were not worked laterally, but in a vertical direction. Then the animal became restless, pressed forward and backward in the stall, ran against the wall, and fell down. In the course of a quarter of an hour she got up again and seemed quite normal. She was let loose on to a grass paddock and began to move in a circle to the right, fell down, and was brought back into her stall.

She was treated for brain disturbance, and it was suspected that there was hæmorrhage with external pachymeningitis.

Prognosis was doubtful. The cow was given a drastic

purgative, and the occipital region was dressed with stimulating liniment cum euphorbio, and in the next visit 1'0 c.c. of hydrochlorate of pilocarpine was injected.

Little could be learnt as to the cause of the trouble, but it was ascertained that three weeks after a fight with another cow bleeding from the nose had set in. This was quite insignificant, and the cow had seemed quite lively. It was found that one horn had struck the nose, and the other the back part of the head.

The condition of the animal, which during the illness gave 6 litres (1 $\frac{1}{4}$ gals.) of milk daily, gradually improved, and after three weeks she all right again.—*Deutsche tierärztl. Woch.*

INTESTINAL CHANGES IN EMPHYSEMA BULLOSUM OF SWINE.

By A. MAJA.

Most authors consider that in emphysema bullosum of swine the intestinal mucosa has a normal appearance or only shows the symptoms of a slight catarrh. Rossi also found inflammation of the small intestine and congestion in the abdominal and thoracic organs, and noticed chiefly that the formation of the bullæ characterized the enteritis, which occurs mostly in summer. Roth, Heydemann and Cadéac have also found changes in the mucosa. Maja's observations were made on twenty swine that were slaughtered at the Milan abattoir in the best of health, and which, on *post-mortem*, showed typical lesions of emphysema bullosum. In the lymphatic nodules the bullæ were so numerous that they were swollen to double their size. Vesicles filled with blood were never found. Round the small intestine in many cases there were so many bullæ that the lumen of the intestine was narrowed. On microscopical examination he found numerous vesicles in the submucosa and in the muscularis of the intestinal wall, many also in the mucosa itself; in most cases there was intestinal catarrh here and there, also small pus foci, the mucosa of the intestine was so largely infiltrated with cells that often the gland structure was hidden. In some cases the mucosa showed evidence of necrosis and ulceration.—*Oesterreichische Woch. für Tierheilkunde.*

FURTHER NOTE ON "A CONTAGIOUS DISEASE OF POULTRY."

By R. H. SMYTHE, M.R.C.V.S.

Redruth.

I HAVE made further investigation in the outbreak of disease amongst poultry, which I recorded in the VETERINARY JOURNAL of last month, and I find that the deposits on the oral mucous membrane contain a mycelium and some free bodies, which are probably spores, in addition to various other organisms.

It appears to correspond, therefore, with, and I have no doubt that the disease is "Parasitic Stomatitis," caused by the mould fungus (*Monilia candida*), as described by Friedberger and Fröhner, in *Veterinary Pathology*, vol. i.

Canine Clinicals.

A SUCCESSFUL APPLICATION OF THE PRINCIPLES OF AUTOVACCINATION IN A DOG.

By J. H.

London.

ABOUT the middle of last May the subject, a large bulldog, was bitten in the submaxillary region while fighting. A large abscess formed at the site and was lanced and the cavity irrigated with chinisol solution (1·5 gr. per oz.). The external wound was allowed to heal too rapidly, with the result that about a week later an extensive subcutaneous suppuration was discovered, extending from the original abscess to about the front of the right scapulo-humeral joint and involving all the subcutaneous tissue of the right side of the front of the chest. An opening was made at the lowest point of the swelling an inch or two from the right scapulo-humeral joint in the direction of the middle line, and the pus was removed. Irrigations with chinisol solution were made daily, and after nearly a month of treatment the wound healed up, leaving a contracted fibrous cord from the submaxillary region to the lower part of the front of the chest, causing some disfigurement. Within a week after this the right forearm became greatly enlarged, hot, and painful, and burst at three points, one opening being behind the carpus and the other two close together on the inner aspect of the forearm. From then onwards various methods of treatment were tried without success to obtain disinfection and healing of the wounds.

Irrigations with solutions of chinosol, Jeyes' fluid, corrosive sublimate (1—1,000), and hydrogen peroxide, proved useless. Poulticing and iodine ointment with pot. iod. internally were tried without any improvement resulting. Systemic disturbance was remarkably slight throughout, the animal remaining bright and active and having a good appetite, though somewhat emaciated and slightly lame on the affected leg.

At the end of August the three wounds in the forearm were discharging a dark-greenish pus of the consistency of glycerine. There was not very much swelling of the forearm, but it was tender on manipulation, and the infection had travelled along the tendon sheaths as well as throughout the subcutaneous tissue of the forearm. Smears from the pus were examined by Professor Wooldridge, and showed a mixture of pyogenic organisms, staphylococci predominating. He recommended a trial of auto-vaccination.

Some of the pus was therefore drawn from the forearm with a sterile hypodermic syringe, using a needle of fairly large diameter. A vaccine was prepared from this by Mr. J. B. Buxton, M.R.C.V.S., and contained 100,000 organisms per cubic centimetre. Vaccination of the subject was commenced about the beginning of October. Injections were made every six days, the doses being 1 c.c., $1\frac{1}{2}$ c.c., 2 c.c., 2 c.c., $2\frac{1}{2}$ c.c., $2\frac{1}{2}$ c.c. and 3 c.c., in that order. After the first injection a hot painful swelling, which had begun to form over the left shoulder, disappeared, and after the second injection a slight diminution of the discharge from the forearm was noticed. The dog did not go off his food and appeared as bright as usual. The day after the third injection the dog went off his food, showed a disinclination to walk and remained depressed for two days, and there was increased tenderness of the affected area. No systemic reaction followed the fourth injection, but two of the wounds closed and the swelling diminished somewhat. Systemic reaction did not follow any of the subsequent injections, but the one remaining wound on the inner aspect of the forearm persisted in remaining open and discharged slightly, and a careful examination revealed a very thin strip of straw, about $1\frac{1}{2}$ in. long, in the subcutaneous tissue immediately above the wound. This was removed and the wound healed rapidly. As all local remedial measures and the administration of pot. iod. was stopped when vaccine treatment was commenced, and the improvement only commenced

simultaneously with the vaccine treatment, there can be no doubt that the recovery of this subject in six weeks was entirely due to the vaccine, when ordinary methods of treatment had failed to effect a cure after over four months' trial.

DOUBLE INTUSSUSCEPTION IN THE DOG.

ATTEMPTED OPERATION.

By SIDNEY SMITH, JUN., M.R.C.V.S.

Lowestoft.

A SIX-MONTHS-OLD fox-terrier puppy, which I had been treating for some days for diarrhoea and sickness, was recently brought to me with about 3 in. of prolapsed bowel hanging from the anus. I returned this eversion, but found that the lower part of it would only be pushed just inside the rectum, and there were unmistakable signs that, if left alone, the prolapse would speedily recur. Suspecting intussusception, I manipulated the dog's abdomen, and plainly felt an intestinal mass considerably thicker than the normal. As a forlorn hope I decided to attempt an operation, which, I may say at the outset, was unsuccessful.

Anæsthæsia was brought about in the usual way with 1 gr. of morphia hypodermically. Having opened the abdomen in the middle line, I found that my diagnosis was correct, and that, in fact, there was a double intussusception about 5 in. long. The terminal portion of the colon was doubled on itself near the rectum, and there was a much more pronounced doubling anterior to this with constriction of the bowel and engorgement of the mesenteric vessels. After considerable labour I succeeded in completely reducing the intussusception, but, having done so, I found that owing to stricture and laceration of the muscular coat about an inch of bowel would have to be excised. Having done this, I united the cut ends in the usual way, using gut sutures.

Closing the muscular wound with gut, and the skin wound with silk, completed the operation. The puppy rallied slightly after the operation, but only for a time, and death supervened in about eight hours.

As a matter of fact the dog was exceedingly weak before the operation was started, and I embarked on the task not with the idea of performing some brilliant surgical feat, but of obtaining useful experience of an operation which under more favourable conditions might in future cases be attempted successfully.

My chief object in recording this case is to emphasize the fact that prolapse is so often associated with intussusception, and that what may appear at first sight to be merely everted rectum is in reality intussuscepted colon. If this is recognized at first, so that no time is wasted on sutures of the anus or paraffin wax injections, there is naturally much more chance of a radical operation being successful.

In a previous case I diagnosed eversion of the rectum, used sutures, &c., and only discovered the intussusception at *post-mortem*. In this case I diagnosed the intussusception after prolapse, but was unsuccessful with the operation.

I am hoping that in the next case I may be able to "spot" the condition still earlier, and obtain that satisfactory result which is so encouraging to the operator.

Note on Autoserotherapy.

BY VETERINARY SURGEON P. HAAN.

Revue Générale.

AUTOSEROTHERAPY in serofibrinous pleurisy is not a new method of treatment. It is also much less utilized in veterinary medicine than in human medicine, where it arose at the time when injections of tuberculin were expected to cure tuberculosis. In the year 1899 Dr. Breton used pleural liquid in place of tuberculin, considering that this exudate ought to contain tuberculin. He obtained some rapid cures by injecting into the subcutaneous connective tissue the pleural liquid obtained by exploratory puncture. This method was taken up by Gilbert, of Geneva, then by a number of doctors, who, as a rule, obtained excellent results.

In the horse the etiology of pleurisy is totally different from that of man; in the latter it is often tuberculous, whilst in the horse it may be glanderous or depend on pasteurellosis. It was nevertheless indicated to make some experiments, and Haan tried it during the year 1909 in about twenty cases in remounts. He practised thoracentesis and then injected about 4 c.c. of the liquid withdrawn into the subcutaneous connective tissue; this liquid, even where it contains some bacteria, is reabsorbed with great facility. One observes an immediate improvement in the patients, followed by a rapid cure. An intense diuresis is observed, followed by absorption of the exudate, and this diuresis may be interpreted as a favourable symptom. In ordinary cases resorption is complete in six to ten days.

This method is certainly not infallible, but deserves to be introduced into practice because it produces almost miraculous cures in apparently hopeless cases. It is absolutely harmless. The technique is most simple; it is that of thoracentesis followed by subcutaneous injection.—*Schweizer Archiv für Tierheilkunde.*

Reviews.

Clinical Bacteriology and Vaccine Therapy for Veterinary Surgeons. By W. Scott, F.R.C.V.S. Demy 8vo. Pp. xvi + 222; with 12 plates and 37 figures in the text. Price 7s. 6d. net.

We find from the Register of the Royal College of Veterinary Surgeons that it is nineteen years since the author of this work qualified as a veterinary surgeon, and we venture to say that by keeping in touch with scientific researches and investigations he must be as far in advance of many of his contemporaries at college as Lister was of Percival Potts, the fashionable surgeon of a hundred and thirty years ago.

If there are fifty reasons why a country practitioner cannot keep accurate clinical records (and the ledger would head most men's lists) there must be five hundred reasons why he should not publish them in book form. And Mr. Scott has done much more than this, he has made excellent researches in perhaps the most difficult and exacting branch of therapeutics. He has studied serum and vaccine therapy and the nice technique of these subjects at the famous laboratories at St. Mary's Hospital. He has with much care and ingenuity fitted his own laboratory, studied his own cases—the everyday cases of the country veterinary surgeon—from this new point of view, and recorded his results.

The first sections of the book are devoted to technique—the laboratory, microscope fittings, instruments, culture media, sterilization, &c. This we find the weakest part of the work, in that the author has omitted many of those small but essential precautions which become second nature and appear insignificant to the man constantly engaged in such work, but which if disregarded will lead the tyro into trouble if he has had no real laboratory experience. Each worker, or each laboratory, has, or develops, its own "short cuts" and methods, and we find the description of the preparation of sterile swabs ready to take to a case not very clear and the making of anaerobic cultures is not very lucid—a Buchner's tube is a simple, and not costly, article.

This section is followed by a list of the commoner pathogenic bacteria and their morphological staining and cultural characters, and then the actual cases met with by the author in the field and treated with vaccines of his own preparation. This will be to all readers exceedingly interesting and instructive. In notices respecting new books the stock phrase is "Every veterinary surgeon should have this work on his book-shelves," but we do not hesitate in saying that every country and town practitioner should read and re-read the sections dealing with abscesses and their treatment, for many of us are sadly out of date with regard to injections of caustics and antiseptics.

Few will raise the enthusiasm of the author on the subject of vaccines, but all will reap benefit from the new line of thought

suggested—new, that is, to the veterinary practitioner when applied to his everyday cases.

Many having experience will disagree with the doses of dead bacilli given. We believe that good results have been obtained with much smaller doses, especially with the dog.

Swine fever is well treated, and, in view of the lack of success following the present English methods of treatment, it is well to be acquainted with the lines adopted in Holland, which the author has investigated at Rotterdam.

Many dissentients will be found to some of the author's views and he may receive severe criticism, but he has done the profession a good service.

The Report upon the State of Public Health in the City of Dublin for the Year 1912.

We have received the Fifty-first Annual Report, *i.e.*, for the year 1912, by Sir Charles A. Cameron, Chief Medical Officer of Health for the City of Dublin. Mr. Andrew Watson, M.R.C.V.S., as is well known, is the veterinary surgeon to the Public Health Committee, and Sir Charles Cameron reports that his time was so fully occupied with the outbreak of foot-and-mouth disease that he was unable to give as much attention to the udders of dairy cows as he usually gives them. It is pointed out in the Report that tuberculosis of the udder is by no means the only diseased condition that demands interdiction of the milk; for instance, a common pathological condition of the cow's udder is mastitis, not generally recognized by others than veterinarians. Sir Charles Cameron points out to the Health Committee that milk from such an udder, if used for human consumption, would be highly dangerous. He reminds us that Professor Holst, of Christiana, found that milk from an inflamed mammary gland caused acute catarrh of the stomach in four adults and four children.

We learn from this Report that the inspection of food in Dublin is conducted by Mr. Andrew Watson, four meat inspectors, and by Sir Charles Cameron himself. No less than 136,000 lb. of unsound food were confiscated by the Corporation Abattoir during the period under review, and 40,000 lb. were voluntarily surrendered. The able veterinary surgeon of the Corporation, as he is described in the Report, paid no less than 18,561 visits to slaughter-houses, shops, and hawkers' stands, &c. The Report is a very complete one, and redounds to the credit of the Public Health Department of Dublin. It is only to be regretted that the social and economic conditions of the Irish capital are such that public health authorities in all departments seem like good men struggling against adversity in the task daily and hourly before them.

From Southern Rhodesia.

We have received the Report of the Chief Veterinary Surgeon, Southern Rhodesia, Mr. J. M. Sinclair, M.R.C.V.S., for the year

1912, and also a Report from the Veterinary Bacteriologist, Mr. Llewellyn E. W. Bevan, for the same period. African coast fever still causes considerable trouble in the territory under survey, though the outbreaks are happily diminishing in quantity. Five fresh outbreaks occurred during the year, compared with eight in the previous year and eighteen in 1910. Mr. Sinclair expresses the opinion that the cattle owner who fenced his farm and dipped his cattle regularly need not fear coast fever, and regular dipping is enforced in all infected areas. Anthrax is not unknown, and there was an outbreak of contagious pleuro-pneumonia. No case of glanders occurred during the year, though rabies is not infrequent. Very useful work is being done in the Government Veterinary Laboratory by Mr. Bevan, and on the whole we congratulate the Department on its therapeutic and prophylactic activities, and on its admirably clear reports.

THE HUNTING MEMORIAL FUND.

A MEETING to inaugurate this Fund was held at the Royal College of Veterinary Surgeons, 10, Red Lion Square, W.C., on Thursday evening, November 13, 1913, when Professor James Macqueen, Royal Veterinary College, was elected Chairman, and Mr. Henry Gray, Secretary and Treasurer.

Letters were read from Messrs. Cameron (Berwick-on-Tweed), Emerton, George Edward King (Abingdon), E. Wallis Hoare, Sydney Villar, and others.

It was decided to erect a memorial stone upon Mr. Hunting's grave, and also to purchase an adjoining plot of ground. As to other suggestions regarding a prize or an annual lectureship, it was decided that they be left open to some future time.

A General Committee was formed as follows: The Presidents and Secretaries of all existing veterinary societies in the British Empire, the members of the Council of the Royal College of Veterinary Surgeons, the principal and professors of all the veterinary schools in the British Empire, all the veterinary officers of the British Board of Agriculture and Fisheries and of the Irish Department of Agriculture and Technical Instruction, all the officers of the Army Veterinary Service in the British Empire, and all officers of the Indian Civil Veterinary Department.

Ultimately a Sub-Committee was formed, five members of which were to form a quorum. It was constituted as follows: Sir John McFadyean, Sir Stewart Stockman, Major-General

Smith, Veterinary-Captain Graham Rees-Mogg, 1st Life Guards, and Messrs. Hugh Begg, W. Roger Clarke, Joseph Emerton, E. Wallis Hoare, Robert Crystal Irving, H. A. MacCormack, and Professor Wooldridge, Professor James Macqueen, and Mr. Henry Gray being *ex-officio* members.

The next meeting of the Sub-Committee will take place on December 12, at 7.30 in the evening, at the Royal College of Veterinary Surgeons, 10, Red Lion Square, W.C. A meeting of the General Committee will be held in January on the evening of the day of the Royal College of Veterinary Surgeons' Committee meeting.

The following subscriptions received were announced:—

	£	s.	d.
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In the meantime subscriptions may be sent to the Hon. Treasurer and Secretary, Mr. Henry Gray, 23, Upper Phillimore Place, London, W. Cheques should be made out to the "Hunting Memorial Fund," and crossed "City and Midland Bank, Ltd., Earl's Court Road Branch."

ERRATA.

IN the review of Hutyra and Marek's "Special Pathology and Therapeutics of the Diseases of Domestic Animals" on p. 539 of last month's issue a grotesque error of typography appears in connection with the names of the English translators of the work. The names of Messrs. Leslie Sheather and G. Mayall are followed in each case by the word "Molest." This should, of course, have been M.R.C.V.S. Dr. Mohler's name also is wrongly spelt "Mobler."

Books and Periodicals, &c., Received.

Journal of the Royal Army Medical Corps; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Österreichische Wochenschrift für Tierheilkunde; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine; Memoirs of the Department of Agriculture in India; Annual Report Punjab Veterinary College, C.V.D.; Annual Report Veterinary Pathological Laboratory, Nairobi.

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